DISTRICT OFFICE
Union R-XI School District
1 Wildcat Drive
Union, MO 63084
Phone 636.583.8626

Union R-XI
Middle School Classroom Addition
Volume 1

Project Manual

Project No. 1710.04-004

February 12, 2019

NAVIGATE
BUILDING SOLUTIONS

HTK
ARCHITECTS PA

PROJECT MANUAL
Project No. 1710.04-004
Date February 12, 2019

PROJECT
Union R-XI Middle School Addition

OWNER
Union R-XI School District
1 Wildcat Dr.
Union, MO 63084

OWNER'S REPRESENTATIVE
Navigate Building Solutions
9920 Watson Rd. Suite 201
St. Louis, MO 63126

ARCHITECT
HTK Architects, P.A.
9300 W. 110th St., Suite 150
Overland Park, Kansas 66210-1443
(913) 663-5373

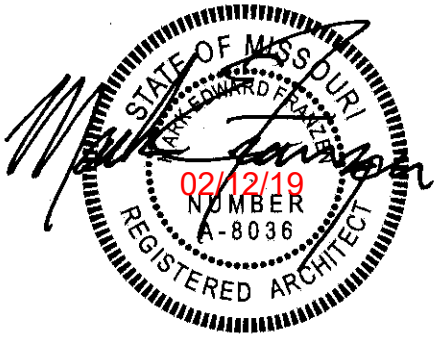
CIVIL ENGINEER
Wunderlich Surveying & Engineering, Inc.
512 East Main St.
Union, MO 63084

STRUCTURAL ENGINEER
Bob. D. Campball & Co., Inc.
4338 Belleview
Kansas City, MO 64111

MEP ENGINEERS
Smith & Boucher Engineers
25501 West Valley Parkway
Olathe, KS 66061

ARCHITECT'S PROFESSIONAL SEAL

The drawings, specifications, and other documents referenced in the enclosed Table of Contents for this project (identified in the header above) have been prepared by or under the direct supervision of the following licensed architect(s), with the exception of the following: portions of Division 3, 5, and 31-33 specifications, the entire Divisions 21-28 specifications, and the drawings identified as "Civil" "Structural" "Mechanical" and "Electrical". Those documents pertain directly to the work of the consultants involved with this project, who will separately identify and seal the work for which they are responsible.



CIVIL ENGINEER'S PROFESSIONAL SEAL

Kristopher H. Wolfe

PE-2008019619

Civil Plans C1.1 to C5.7

Specification Section 02000 to Section 03100

STRUCTURAL ENGINEER'S PROFESSIONAL SEAL

I hereby specify that the documents intended to be authenticated by my seal are limited to:

Section 03 3000	Cast-In-Place Concrete
Section 04 2000	Unit Masonry
Section 05 1200	Structural Steel Framing
Section 05 2100	Steel Joist Framing
Section 05 3100	Steel Decking
Section 05 4000	Cold-Formed Metal Framing

And I hereby disclaim any responsibility for all other specifications, estimates, reports or other documents or instruments relating to or intended to be used for any part or parts for Olathe USD 223: New Elementary School #36.

By: Clark Basinger
Bob D. Campbell & Company

MECHANICAL & ELECTRICAL ENGINEER'S PROFESSIONAL SEAL

I, Philip R. Ptacek, P.E., Missouri License No. EN 027287, state that the Specifications intended to be authenticated by my seal are limited to Specification Sections listed below:

Division 21, Sections:	210500, 211100, 211313;
Division 22, Sections:	220500, 220513, 220516, 220519, 220523, 220529, 220548, 220553, 220719, 221116, 221119, 221123, 221316, 221319, 223400, 224000, 224700;
Division 23, Sections:	230500, 230513, 230517, 230518, 230519, 230523, 230529, 230548, 230553, 230593, 230713, 230719, 230900, 231123, 232113, 233113, 233300, 233416, 233600, 233713, 237413, 238239;
Division 26, Sections:	260500, 260502, 260519, 260523, 260526, 260529, 260553, 260544, 260553, 260923, 262416, 262726, 262813, 262816, 265119, 265600;
Division 27, Sections:	270500, 270526, 270528, 270536, 271300, 271500;
Division 28, Sections:	280500, 280513, 281311, 283111.

I hereby disclaim any responsibility for all other specifications, drawings estimates, reports, or other documents or instruments relating to or intended to be used for any part or parts of the architectural or engineering project or survey.

PROJECT MANUAL TABLE OF CONTENTS

VOLUME 1
PROCUREMENT AND CONTRACTING REQUIREMENTS

000101 – PROJECT TITLE PAGE
000107 – PROFESSIONAL SEALS
000525– A101
000526 – A201
001116 – INVITATION TO BID
002213 – SUPPLEMENTARY INSTRUCTIONS TO BIDDERS
003114 – SITE LOGISTICS PLAN
003132 – GEOTECHNICAL DATA
004343 – WAGE RATES
007106 – DIGITAL DATA AGREEMENT, AIA C106
007115 – SUBSTITUTION REQUEST FORM CSI 1.5C

SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

011000 – SCOPE OF WORK
012300 – ALTERNATES
012500 – SUBSTITUTION PROCEDURES
012600 – CONTRACT MODIFICATION PROCEDURES
– CHANGE ORDER MARKUP
012900 – PAYMENT PROCEDURES
013100 – PROJECT MANAGEMENT AND COORDINATION
013300 – SUBMITTAL PROCEDURES
014000 – QUALITY REQUIREMENTS
016000 – PRODUCT REQUIREMENTS
017300 – EXECUTION
017700 – CLOSEOUT PROCEDURES
017823 – OPERATION AND MAINTENANCE DATA
017839 – PROJECT RECORD DOCUMENTS
017900 – DEMONSTRATION AND TRAINING

DIVISION 2 – EXISTING CONDITIONS & SITEWORK

020000 – EARTHWORK
021000 – AGGREGATE BASE COURSE
022000 – STORM SEWER
023000 – WATER MAIN SUPPLY
024000 – GRAVITY SEWER
024119 – SELECTIVE STRUCTURE DEMOLITION
025000 – CONCRETE SIDEWALK
026000 – RIP RAP
027000 – FINISH GRADING AND SEEDING
028000 – TRAFFIC REGULATIONS
029000 – CEMENT CONCRETE PAVEMENT
030000 – HOT-MIX ASPHALT PAVING
031000 – PAVEMENT MARKING

DIVISION 3 - CONCRETE

033000 – CAST-IN-PLACE CONCRETE

DIVISION 4 - MASONRY

042000 – UNIT MASONRY

DIVISION 5 - METALS

051200 – STRUCTURAL STEEL FRAMING
052100 – STEEL JOIST FRAMING
053100 – STEEL DECKING
054000 – COLD FORMED METAL FRAMING
055000 – METAL FABRICATIONS
055213 – PIPE AND TUBE RAILINGS
057500 – DECORATIVE FORMED METAL

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES
061000 - ROUGH CARPENTRY
061600 – SHEATHING

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
072100 – THERMAL INSULATION
072726 – FLUID-APPLIED MEMBRANE AIR BARRIERS
074231.13-FORMED METAL WALL PANEL
075113.11 – BUILT-UP ASPHALT ROOFING, HOT-APPLIED
076200 – SHEET METAL FLASHING AND TRIM
077100 – ROOF SPECIALTIES
077200 – ROOF ACCESSORIES
078100 – APPLIED FIREPROOFING
078413 – PENETRATION FIRESTOPPING
079200 – JOINT SEALANTS
079500.13 – INTERIOR EXANSION JOINT COVER ASSEMBLIES
079500.16 – EXTERIOR EXANSION JOINT COVER ASSEMBLIES

DIVISION 8 - OPENINGS
081113 – HOLLOW METAL DOORS AND FRAMES
081416 – FLUSH WOOD DOORS
083113 – ACCESS DOORS AND FRAMES
084113 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
087100 – FINISH HARDWARE
088000 – GLAZING

DIVISION 9 - FINISHES
092216 – NON-STRUCTURAL METAL FRAMING
092900 – GYPSUM BOARD
093013 – CERAMIC TILING
095113 – ACOUSTICAL PANEL CEILINGS
096513 – RESILIENT BASE AND ACCESSORIES
096519 – RESILIENT TILE FLOORING
096723 – RESINOUS FLOORING
099113 – EXTERIOR PAINTING
099123 – INTERIOR PAINTING

DIVISION 10 - SPECIALTIES
101100 – VISUAL DISPLAY UNITS
101423 – ROOM-IDENTIFICATION PANEL SIGNAGE
102113.19 – PLASTIC TOLIET COMPARTMENTS
102600 – WALL AND DOOR PROTECTION
102800 – TOLIET, BATH, AND LAUNDRY ACCESSORIES
104413 – FIRE EXTINGUISHER CABINETS
104416 – FIRE EXTINGUISHERS

DIVISION 11 - EQUIPMENT
NA

DIVISION 12 - FURNISHINGS
122413 – ROLLER WINDOW SHADES

123216 – MANUFACTURED PLASTIC-LAMINATE-FACED CASEWORK
123623.13 – PLASTIC-LAMINATE-CLAD COUNTERTOPS
123661.16 – SOLID SURFACE COUNTERTOP

DIVISION 13 – SPECIAL CONSTRUCTION
NA

VOLUME 2

DIVISION 21 – FIRE SUPPRESSION
210500 Common Work Results for Fire Suppression
211100 Facility Fire Suppression Water Service Piping
211313 Wet-Pipe Sprinkler Systems

DIVISION 22 – PLUMBING
220500 Common Work Results for Plumbing
220513 Common Motor Requirements for Plumbing Equipment
220516 Expansion Fittings and Loops for Plumbing Piping
220519 Meters and Gages for Plumbing Piping
220523 Valves – Plumbing
220529 Hangers and Supports for Plumbing Piping and Equipment
220548 Vibration Controls for Plumbing Piping and Equipment
220553 Identification for Plumbing Piping and Equipment
220719 Plumbing Piping Insulation
221116 Domestic Water Piping
221119 Domestic Water Piping Specialties
221123 Domestic Water Pumps
221316 Sanitary Waste and Vent Piping
221319 Sanitary Waste Piping Specialties
223400 Gas, Domestic-Water Heaters
224000 Plumbing Fixtures
224700 Drinking Fountains and Water Coolers

DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING
230500 Common Work Results for HVAC
230513 Motors for HVAC Equipment
230517 Sleeves and Sleeve Seals for HVAC Piping
230518 Escutcheons for HVAC Piping
230519 Meters & Gages – HVAC
230523 Valves – HVAC
230529 Hangers & Supports – HVAC
230548 Vibration Controls for HVAC Piping and Equipment
230553 HVAC System Identification
230593 Testing, Adjusting, and Balancing for HVAC
230713 Duct Insulation
230719 HVAC Piping Insulation
230900 HVAC Instrumentation and Controls
231123 Facility Natural-Gas Piping
232113 Hydronic Piping
233113 Metal Ducts
233300 Duct Accessories
233416 Centrifugal HVAC Fans
233600 Air Terminal Units
233713 Diffusers, Registers, and Grilles

237413 Packaged, Outdoor, Central-Station Air-Handling Units
238239 Unit Heaters

DIVISION 26 – ELECTRICAL
260500 Common Work Results for Electrical
260502 Equipment Wiring Systems
260519 Low Voltage Electrical Power Conductors and Cables
260523 Control Voltage Power Conductors and Cables
260526 Grounding and Bonding for Electrical Systems
260529 Hangers and Supports for Electrical Systems
260533 Raceways and Boxes for Electrical Systems
260544 Sleeves and Sleeve Seals for Electrical Systems
260553 Identification for Electrical Systems
260923 Lighting Control Devices
262416 Panelboards
262726 Wiring Devices
262813 Fuses
262816 Enclosed Switches and Circuit Breakers
265119 LED Interior Lighting
265600 LED Exterior Lighting

DIVISION 27 – COMMUNICATIONS
270500 Common Work Results for Communication Systems
270526 Grounding and Bonding for Communication Systems
270528 Pathways for Communication Systems
270536 Cable Trays for Communication Systems
271300 Communications Backbone Cabling
271500 Communications Horizontal Cabling

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY
280500 Common Work Results for Electronic Safety and Security
280513 Conductors and Cables for Electronic Safety and Security
281311 Access Control
283111 Digital, Addressable Fire-Alarm System

DIVISION 31 - EARTHWORK
NA

DIVISION 32 – EXTERIOR IMPROVEMENTS
NA

DIVISION 33 – UTILITIES
NA

DRAWING INDEX
(SEE DRAWING INDEX ON SHEET G101 OF DRAWING SET)

End of Table of Contents

AIA® Document A101™ – 2017

Standard Form of Agreement Between Owner and Contractor *where the basis of payment is a Stipulated Sum*

AGREEMENT made as of the 20th day of March in the year 2019
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

Union R-XI School District
#1 Wildcat Drive
Union, MO 63084
Telephone Number: (636) 583-8626

and the Contractor:
(Name, legal status, address and other information)

TBD

for the following Project:
(Name, location and detailed description)

Union R-XI Middle School Classroom Addition

The Architect:
(Name, legal status, address and other information)

HTK Architects, P.A.
9300 W. 110th Street,Suite 150
Overland Park, KS 66210
Telephone Number: (913) 663-5373

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.
/

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[ ] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[X] Established as follows:

The date of commencement of the Work shall be fixed in a notice to proceed issued by the Owner or shall be the date of this Agreement, whichever is issued first.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of all work inside the existing buildings, bid alternates, anticipated soil treatment/remediation identified on the bid form, and associated Site Work:
(Check one of the following boxes and complete the necessary information.)

[X] Not later than Two Hundred Forty-six (246) calendar days from the notice to proceed, issued by the Owner, and subject to any time extensions permitted hereunder for excusable delays or Owner requested changes.

[ ] By the following date:

§ 3.3.2 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5. Such damages shall be in addition to, and not in lieu of, any other rights or remedies Owner may have against Contractor for failure to timely achieve Substantial Completion, and damages for failure to achieve Substantial Completion and failure to achieve Final Completion may run concurrently. If the Work is not finally completed by the time stated in the Agreement, or as extended, no payments for Work completed beyond that time shall be made until the Project reaches Final Completion.

§3.3.3 The Contractor shall also include within the Two Hundred Forty-six (246) calendar days an allowance of Thirty-Five (35) Calendar days for delays due to weather.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be TBD ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

Item	Price
Base Bid including Performance & Payment Bond	TBD

§ 4.2.2 The Owner reserves the Right to accept the following alternates through the Change Order Process post execution of this Agreement for the amounts below. This Contractor will advise the Owner on when these decisions need to be made in order to not delay the Project. Contractor must hold prices for these Alternates until March 1st, 2019

Item	Price	Conditions for Acceptance
Alternate No. 1: Fire Sprinkler Addition		
Alernate No. 2: Circle Drive		

§ 4.3 Allowances, if any, included in the Contract Sum:

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)
Unit Price No. 1: Removal of unsuitable soils and Import & compaction of suitable soils	Per Cubic Yard	TBD
Unit Price No. 2: Treatment of on-site unsatisfactory soils	Per Cubic Yard	TBD
Unit Price No. 3: Removal and haul-off of rippable rock	Per Cubic Yard	TBD
Unit Price No. 4: Removal and haul-off of rippable rock	Per Cubic Yard	TBD
Unit Price of No. 5: Removal and haul-off of rippable rock	Per Cubic Yard	TBD
Unit Price of No. 6: Removal and disposal of existing buried concrete man-made structures	Per Cubic Yard	TBD
Unit Price of No. 7: Removal of unsuitable soils and placement of lean concrete for soil remediation	Per Cubic Yard	TBD
Unit Price of No. 8: Load and haul-off of surplus soils	Per Cubic Yard	TBD
Unit Price No. 9: Soil import and Placement and Compaction	Per Cubic Yard	TBD
Unit Price No. 10: 1" clean rock Placement and Compaction	Per Cubic Yard	TBD
Unit Price No. 11: 1" minus rock Placement and Compaction	Per Cubic Yard	TBD
Unit Price No. 12: 2" clean rock Placement and Compaction	Per Cubic Yard	TBD
Unit Price No. 13: 2" minus rock Placement and Compaction	Per Cubic Yard	TBD
Unit Price No. 14: Topsoil place and final grade	Per Cubic Yard	TBD
Unit Price No. 15: Removal of unsuitable soils and import & compaction of granular material per Geotech recommendations	Per Cubic Yard	TBD

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

§4.5.1 Contractor understands that time is of the essence for the Owner as to the deadlines set forth in this Contract, that Owner will be harmed if Contractor fails to complete the Project in timely manner, that precise quantification of damages for such harm would be difficult, and the amounts specified herein as Liquidated Damages for delay are reasonable. Contractor shall be responsible to maintain scheduled items for the Contractor's work as shown in the Contract Documents. In the event that the Contractor does not substantially complete the work within the existing building and associated site work by the required Substantial Completion date, the Contractor agrees to pay the Owner, or to deduct from the Contract Sum, not as a penalty, but as liquidated damages, the amount of $1,500 for each and every calendar day that Substantial Completion is delayed.

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

§ 4.5.2 If Contractor shall neglect, refuse, or fail to complete the remaining work and closeout documents within Thirty (30) calendar days after Substantial Completion (including any proper extension granted by the Owner), Contractor shall pay the Owner the stipulated sum of Five Hundred Dollars ($500) for each day that expires after the time specified for completion & readiness for final payment.

§ 4.5.3 If the Contractor shall neglect, refuse, or fail to submit the project submittals within Ninety (90) calendar days after Notice to Proceed (including any proper extension granted by the Owner), Contractor shall pay the Owner the stipulated sum of Five Hundred Dollars ($500) for each day beyond the 90 calendar days milestone.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that a draft Application for Payment is received electronically by the Architect and the Owner's Representative not later than the 20th day of the invoicing month and subsequently recommended for approval, and the official Application for Payment is received by the Architect not later than the first day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the last day of the same month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Architect receives the Application for Payment. Notwithstanding the above, payments will be made as soon as practicable after the board meeting of
the Owner's Board of Education following receipt of the invoice. In no case will payment be delayed more than thirty (30) days. Moreover, if Owner is entitled to deduct damages or amounts provided in the Contract Documents, including clean-up fees, then Owner shall be entitled to deduct such damages, amounts and fees at any tim
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. If Contractor fails or refuses to complete the Work, or has unsettled claims with Owner, any payment to Contractor shall be subject to deduction for such amounts as the Architect shall determine as the cost for completing incomplete Work and the value of unsettled claims.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

Applications for Payments shall be submitted on AIA Documents G732 and G703. In the event of a dispute with regard to any item included in an Application for Payment, the Owner shall make payment

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

for items not in dispute and shall have the right to withhold from payment the amount of such disputed item while the parties attempt to resolve the dispute in accordance with the dispute resolution provisions provided for in the Contract Documents.

Such applications shall include:

- Certified Payrolls, An original accounting of all labor rates and hours of Work
- Invoices for all materials, rental equipment, and Contractor's statements.
- Copies of Contractor's daily log
- Compliance with prevailing wage laws as per annual wage order issued with this contract

• If invoicing for stored materials that have not been delivered to the project site, the following must be provided: proof of stored materials including certificate of insurance for facility where materials are stored, photographs of such materials, materials are labeled with signs indicating materials are "Property of the Union School District" and copies of invoices for materials from the vendors/supplier.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of Five Percent (5%) Pending final determination of cost to the Owner of Changes in the work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201-2017, General Conditions of the Contract for Construction;

.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing, less retainage of Five Percent (5%);

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201-2017.

§ 5.1.6.2 The progress payment amount determined in accordance with Section 5.1.6.1 shall be further modified under the following circumstances:

.1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and

.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201-2017.

(Paragraph Deleted)

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due: 5%

§ 5.1.7.1.1 The following items are not subject to retainage: None

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, \ including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

None

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

At the time of this agreement, there are no known advance payments requested.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum minus disputed sums and authorized deducations, shall be made by the Owner to the Contractor after

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

.3 The Contractor has completed all punchlist items to the satisfaction of the Owner's Representative, Architect and Owner.

.4 The Contractor has delivered all closeout Documentation required under the Contractor Documents, which include (1) original-final release of claims from Contractor (AIA G706 and G706A), in triplicate-operation and maintenance instructions/manuals; (4) original's of final certified payrolls from Contractor and all lower tier'd subcontractors, (1) original affadavit of compliance with prevailing wage laws from contractor and all lower tiered subcontractors, schedules, in triplicate equipment manuals, in triplicate marked up record documents, and in triplicate other closeout documents reasonably required by the Owner.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the vote of the Owner's Board of Education, or as follows:

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker. Any claims or disputes between the parties of this agreement arising from or relating to this agreement or breach thereof, shall, as a condition prior to binding litigation, shall be submitted to non-binding mediation. The mediator's fees and expenses and any costs associated with the mediation shall be borne equally by both parties. Each party shall be responsible for paying its own costs, expenses, and attorney fees related to participating in the mediation. Disputes under this agreement shall be exclusively litigated in the Circuit Court for Franklin County, Missouri. *(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

§ 6.2 Binding Dispute Resolution

Any Claim, dispute or other matter in question or arising out of or related to this Contract that is not resolved by the determination of the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017 shall be mediated as provided in Section 15.3 thereof. If either party so desires, or if mediation fails to resolve the dispute, the dispute may be resolved by litigation.

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the abscense thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 8.31 The Owner's representative:
(Name, address, email address, and other information)

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

The Owner has retained Navigate Building Solutions, LLC as its Construction Manager for the project. The Contractor shall cooperate with the Construction Manager's Representative to the same extent as the Owner.

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

TBD

§ 8.3.3 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.4 Compliance with Laws:

§ 8.4.1 The Contractor shall comply with all local, state, and federal laws, rules, and regulations applicable to the provision of services and products under the Contract, including but not limited to: the Americas with Disabilities Act, employment discrimination laws, wage and hour laws (including as required by Sections 290.210 et seq. R.S.Mo.), the transient employer financial assurance law (Sections 285.230 et seq. RSMo.), and public contracting laws. The Contractor affirmatively states that payment of all local, state, and federal taxes and assessments owed by the Contractor is either current or under lawful protest with the applicable taxing jurisdiction.

§ 8.4.2 Not less than the prevailing hourly rate of wages specified under Section 290.210-290.340 of the Revised Missouri Statues and set out in the Wage Determination shall be paid to all workers performing Work under this Contract.The Contractor shall forfeit as provided in Section 290.250 of the Revised Missouri Statutes as a penalty to the Owner the sum of One Hundred Dollars ($100.00) for each worker employed, for each calendar day, or portion thereof, that such worker is paid less than the prevailing rate for any work done under said Contract by the Contractor or by any of its Subcontractors.

§ 8.4.3 The Contractor and all subcontractors to the contract must require all on-site employees to complete the ten-hour safety training program required under Section 292.675, RSMo, if they have not previously completed the program and have documentation of having done so. The Contractor will forfeit a penalty to the Owner of $2500 plus an additional $100 for each employee employed by the Contractor or Subcontractor, for the calendar day, or portion thereof, such employee is employed without the required training.

§ 8.4.4 Every transient employer, as defined in Section 285.230, RsMo, must post in a prominent and easily accessible place at the work site a clearly legible copy of the following: (1) The notice of registration of employer withholding issued to such transient employer by the director of revenue; (2) Proof of coverage for workers' compensation insurance or self-insurance signed by the transient employer and verified by the department of revenue through the records of the division of workers' compensation; and (3) The notice of registration for unemployment insurance issued to such transient employer by the division of employment security. Any transient employer failing to comply with these requirements shall, under section 285.234, RsMo, be liable for a penalty of Five Hundred Dollars ($500.00) per day until the notices required by this section are posted as required by that statute.

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

§ 8.5 Certified Payroll

§ 8.5.1 The Contractor & each Subcontractor are required to submit, WEEKLY, ONE (1) Certified ORIGINAL for each week that work is in progress & SHOULD BE NUMBERED SEQUENTIALLY.If work is temporarily suspended, the last payroll should be appropriately marked to note that it would be the last payroll until work is resumed. Submitter shall make sure that each payroll is numbered and dated, includes the name of the Project on it as well as the name of the Subcontractor.It is important that submitter number ALL payrolls sequentially. This will keep Contractor from having to send "No Work" payrolls when no hours are logged for a pay period.It will also make it easier to track and communicate any inconsistencies. Submitter shall label each of the "Final Payrolls" from each contractor/subcontractor as such.

§ 8.5.2 The Contractor must submit one (1) certified originals of each weekly payroll within 7 days of the payment date of the payroll.The certification may be attached to the payroll or may be on the payroll itself.The Contractor will be considered responsible for submittal of payrolls and certifications for all their sub recipients on the project. The certification must be properly signed originals.Electronic submittal of certified payrolls is not permitted.Failure to submit these payrolls within the 7-day period will result in delay in submittal of pay applications.All certified payrolls must be certified by an officer of the company only.Contractor cannot certify several pay periods with only one payroll certification.This is unacceptable to the Department of Labor.Each certification must also be dated and signed to be valid.Owner would prefer that the certification be signed in a color other than black.Owner can accept Xeroxed payrolls; however, the certifications must each be signed with an original, live signature.
THE OWNER CANNOT ACCEPT COPIED SIGNATURES ON THE PAYROLL CERTIFICATIONS.
The employee's full name must be used.Addresses are not optional and MUST be listed on publicly funded projects such as this one.Social Security numbers are no longer allowed on certified payrolls, however, in lieu of the Social Security number; the contractor must assign the employee an identification number and place that identification number on the certified payroll.The identification number can be the last four digits of the employee's Social Security number.Employers (prime contractors and subcontractors) must maintain the current address and full SSN for each employee and must provide this information upon request to the contracting agencyor other authorized representative responsible for labor standards compliance.All deductions must be clearly identified.Only approved deductions should be used in wage rate calculations as per the Code of Federal Regulations.The US Department of Labor Form LS-57 may be used, as this form complies with all code requirements.If any part of the payroll or payroll certification is illegible or not completely filled out, they will be returned to your office for correction and re-submission.IMPORTANT NOTE: APPRENTICE CERTIFICATION LETTERS MUST ACCOMPANY CERTIFIED PAYROLLS THE 1ST TIME THEIR NAME APPEARS ON A CERTIFIED PAYROLL-IF NOT ATTACHED IT WILL DELAY APPROVAL OF CERTIFIED PAYROLL, AND THEREFORE PAY APPLICATION SUBMISSION.

§ 8.5.3 Unauthorized Alien Act Compliance and Federal Work Authorization Program Enrollment - No business or entity involved with this project shall employ an unauthorized alien to perform work within the state of Missouri.As a condition for the award of any contract or grant in excess of $5,000.00, the business entity shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program (for example, the so called Federal E-Verify Program) with respect to the employees working in connection with the contracted services (see section 285.530 RSMo, enclosed in the laws section).To reaffirm - All Contractors are required to obtain and make available for inspection by the contracting public body from each subcontractor of any tier, an original sworn affidavit which affirms, under penalty of perjury, that the subcontractor is enrolled & actively participating in a federal work authorization program, that the subcontractor does not knowingly employ any person who is an Unauthorized Alien in connection with the contracted services, and the subcontractor's employee's are lawfully present in the United States.The Contractor shall comply with all applicable federal, state & local labor laws & is not knowingly in violation of §RSMo 285.530(1) and shall not henceforth be in such violation. This shall appear in contracts between the general contractor and subcontractors and contracts between subcontractors of any tier.

§ 8.6 Liability and Indemnity:

§ 8.6.1 In no event shall the Owner be liable to the Contractor for special, indirect, or consequential damages, except those caused by the Owner's willful misconduct arising out of or in any way connected with a breach of this Contract. The maximum liability of the Owner shall be limited to the amount of money to be paid by the Owner under this Contract.

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

§ 8.6.2 The Contractor shall defend, indemnify, and hold harmless the Owner, its elected or appointed officials, Architect, Owner's Representative, and their respective consultants, insurers, agents, and employees, from and against any and all liability, suits, damages, costs (including attorney fees), losses, outlays and expenses from claims in any manner caused by, or allegedly caused by, or arising out of or connected with, this Contract, or the work of any subcontract hereunder (the Contractor hereby assuming full responsibility for relations with subcontractors), including but not limited to claims for personal injuries, death, or property damage (other than the Work itself), regardless of whether the loss to be indemnified was caused in part by an indemnified person.

§ 8.6.3 The Contractor shall indemnify and hold the Owner harmless from all wages or overtime compensation due any employees in rendering services pursuant to the Contract or any subcontract, including payment of reasonable attorneys' fees and costs in the defense of any claim made under the Fair Labor Standards Act, the Missouri Prevailing Wage Law or any other federal or state law.

§ 8.6.4 By executing this Contract the Contractor represents that the Contractor has reviewed the Contract Documents and affirms that the Contractor is not aware of any material defects in said documents that might prevent the Contractor from completing the Work and the Project as promised herein. The Contractor accordingly waives any claim of such material defect against the Owner.

§ 8.6.5 Contractor stipulates that Owner is a political subdivision of the State of Missouri, and as such, enjoys immunities from suit and liability as provided by the Constitution and laws of the State of Missouri. By entering into this Agreement, Owner does not waive any of its immunities from suit and/or liability, except as otherwise specifically provided herein and as specifically authorized by law.

§ 8.6.6 The Contractor may not assign its responsibilities, duties, obligations and rights under this Agreement, without the express written consent of the Owner. This does not prevent Contractor from engaging subcontractors to perform various phases of the Project, but Contractor shall be fully responsible to Owner for the work, actions and omissions of all such subcontractors.

§ 8.6.7 This Agreement, in its entirety, shall be binding upon all the parties hereto, their respective successors, heirs, executors, administrators or assigns.

§ 8.6.8 No delay or omission by either of the parties hereto in exercising any right or power accruing upon the noncompliance or failure of performance by the other party hereto of any of the provisions of this Agreement shall impair any such right or power or be construed to be a waiver thereof. A waiver by either of the parties hereto of any of the covenants, conditions or agreements hereof to be performed by the other party hereto shall not be construed to be a waiver of any subsequent breach thereof or of any other covenant, condition or agreement herein contained.

§ 8.7 Contractor's Responsibility for Subcontractors

The Contractor shall be as fully responsible to the Owner for the acts and omissions of its Subcontractors, and of persons either directly or indirectly employed by them, as Contractor is for the acts and omissions of persons it directly employs. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relating to this work to bind all Subcontractors to Contractor by all the terms herein set forth, insofar as applicable to the work of Subcontractors, and to give Contractor the same power regarding termination of any subcontract as the Owner may exercise over the Contractor under any provisions of this Contract. Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the Owner or between any Subcontractors.

§ 8.7.1 The Contractor shall enforce the Owner's alcohol-free, drug-free, tobacco-free, harassment-free and weapon-free policies and zones, which will require compliance with those policies and zones by Contractor's employees, subcontractors, and all other persons carrying out the Contract.

§ 8.8 Conflicts.

§ 8.8.1 Contractor covenants that it has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance of services to be performed under this Contract. The Contractor further covenants that the performance of Contract no person having such interest shall be employed.

§ 8.8.2 No salaried officer, employee or elected official of the Owner shall have a financial interest, direct or

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

indirect, in this Contract. A violation of this provision renders the Contract void. Any federal regulations and applicable provisions in Section 105.450 et seq. RSMo. shall not be violated.

§ 8.9 Assignment.
Contractor shall not assign or transfer any interest in this Contract (whether by assignment or novation), and shall not substitute any specific individuals and/or personnel qualifications without prior written consent of the Owner, except that claims for money due or to become due to the Contractor from the Owner under this Contract may be assigned to a bank, trust company, or other financial institution without such approval, but notice of such assignment or transfer shall be furnished in writing promptly to the Owner. Any such assignment is expressly subject to all rights and remedies of the Owner under this agreement, including the right to change or delete activities from the Contract or to terminate the same as provided herein, and no such assignment shall require the Owner to give any notice to any such assignee of any actions which the Owner may take under this agreement, though Owner will attempt to so notify any such assignee.

§ 8.10 General Independent Contractor Clause
This Contract does not create an employee/employer relationship between the parties. It is the parties' intention that the Contractor will be an independent contractor and not the Owner's employee for all purposes, including, but not limited to, the application of the Fair Labor Standards Act minimum wage and overtime payments, Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Missouri revenue and taxation laws, Missouri workers' compensation and unemployment insurance laws subject to the provisions of this Contract, the Contractor will retain sole and absolute discretion in the judgment of the manner and means of carrying out the Contractor's activities and responsibilities hereunder. The Contractor agrees that it is a separate and independent enterprise from the Owner, that it has a full opportunity to find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This agreement shall not be construed as creating any joint employment relationship between the Contractor and the Owner, and the Owner will not be liable for any obligation incurred by the Contractor, including but not limited to unpaid minimum wages and/or overtime premiums.

§ 8.11 Payment Method
Payments made to the Contractor by the Owner under this Contract shall be effected either by check, electronically or by wire transfer. Contractor shall provide the Owner with information necessary to facilitate same.

§ 8.12 Insurance and Bonds
The Contractor shall secure and maintain at its own cost and expense and throughout the duration of this Contract and until the work is completed and accepted by the Owner, insurance of such types and in such amounts as may be necessary to protect it and the interests of the Owner against all hazards or risks of loss as hereunder specified or which may arise out of the performance of the Contract Documents. The form and limits of such insurance, together with the underwriter thereof in each case, are subject to approval by the Owner. Bid package requires AM Best rating of A-IX or higher. Regardless of such approval, it shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times during the term of the Contract. Failure of the Contractor to maintain coverage shall not relieve it of any contractual responsibility or obligation or liability under the Contract Documents.

Certificates of insurance, including evidence of the required endorsements hereunder or the policies, shall be filed with the Owner within ten (10) days after the date of the receipt of Notice of Award of the Contract to the Contractor and prior to the start of work. Work may not proceed until proof of all required insurance has been provided to the Owner. All insurance policies shall include an ISO Additional Insured Endorsement (CG 20 10 and CG 20 37 2004 editions or equivalent) listing the Owner and the Owner's Representative as additional insureds on a primary basis with owner and/or construction manager insurance excess and not contributory, general liability and auto to contain waiver of subrogation in favor of Owner and its officers, directors and employees, and an ISO Notice of Cancellation/Modification Endorsement providing thirty (30) days written notice to be given by the insurance company to the Owner prior to modification or cancellation of such insurance.

Such notices shall be sent via email to

§ 8.12.1 Minimum Coverages
The minimum coverage for the insurance referred to herein shall be in accordance with the requirements established

AIA Document A201™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

below:

a. Workers' Compensation: Statutory coverage per R.S.Mo. 287.010 et seq.;
Employer's Liability: $1,000,000.00 for bodily injury each accident or disease, each employee for injury by disease.

b. Commercial General Liability Insurance: ISO occurrence form CG00010798 or later edition or equivalent substitute form. Including coverage for Premises, Operations Products and Completed Operations, Contractual Liability, Broad Form Property Damage, Independent Contractors, Explosion, Collapse, and Underground Property Damage and endorsed for blasting if blasting required.Such coverage shall apply to Bodily Injury and Property Damage on an "Occurrence Form Basis" with limits of Three Million Dollars ($3,000,000.00) for all claims arising outofa single accident or occurrence, Three Million Dollars ($3,000,000.00) for products/completed operations and One Million Dollars ($1,000,000.00) for any one person in a single accident or *occurrence/advertising injury. Aggregate limits to apply separately to the Project other than completed operations hazards. ISO CG 25 03 endorsement for general aggregate limit of Three Million Dollars ($3,000,000.00).*

c. Automobile Liability Insurance: ISO CA0001, CA0002, CA0005, CA0020 or equivalent. Covering Bodily Injury and Property Damage for owned, non- owned and hired vehicles with limits of One Million Dollars ($1,000,000.00)for all claims arising out of a single accident or occurrence.

d. Owner's and Contractor's Protective Liability Insurance, to protect the Owner, its agents, servants and employees from claims which may arise from the performance of this Contract, with limits of Two Million, Seven Hundred Fifty Thousand Dollars ($2,750,000.00)for all claims arising out of a single accident or occurrence and Four Hundred Twenty-Five Thousand ($425,000.00) for any one person in a single accident or occurrence.

The Owner's and Contractor's Protective Liability Insurance must:

(1) be a separate policy with the named insured being the Owner;

(2) be with the same insurance company with which the Contractor carries its Commercial General Liability Insurance and Automobile Liability Insurance; and

(3) contain an endorsement that disclaims coverage for any claim barred by the doctrines of sovereign immunity or official immunity, except attorney's fees and other litigation costs incurred in defending a claim. Nothing contained in this policy (or this endorsement thereto) shall constitute any waiver of whatever kind of these defenses or sovereign immunity or official immunity for any monetary amount whatsoever.

e. All-Risk Builders Risk Insurance (if required by the Owner) : Unless specifically authorized by the Owner, the amount of such insurance shall not be less than the total contract price. The policy shall name as insured the Contractor and the Owner.

f. Umbrella Excess: Two Million Dollars ($2,000,000) per occurrence and aggregate over employer's liability, general liability, and auto liability, with "follow-form" of underlying policies.

§ 8.12.2 Subcontractors.
The Contractor shall require all subcontractors to procure and maintain all insurance required in this section and in like amounts and shall provide evidence of such insurance, with the following exceptions:

a. Subcontractors are not required to provide All-Risk Builders Risk Insurance;
b. Subcontractors with an initial contract amount less than $100,000.00 may provide liability coverage limits of $1,000,000.00 in addition to a $1,000,000.00 umbrella policy;
c. Subcontractors need not carry OCPL coverage if contractor's coverage is inclusive;
d. The Contractor and/or subcontractor shall furnish the Owner prior to beginning any work satisfactory proof of carriage of all the insurance required by this Contract, with the provision that policies shall not be canceled, modified or non-renewed without thirty (30) days written notice to the Owner.

§ 8.12.3 Pending Legislation.
If the scope or extent of the Owner's tort liability as a governmental entity as described in Section 537.600 through

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

537.650 R.S.Mo. is broadened or increased during the term of this agreement by legislative or judicial action, the Owner may require Contractor, upon 10 days written notice, to execute a contract addendum whereby the Contractor agrees to provide, at a price not exceeding Contractor's actual increased premium cost, additional liability insurance coverage as the Owner may require to protect the Owner from increased tort liability exposure as the result of such legislative or judicial action. Any such additional insurance coverage shall be evidenced by an appropriate certificate of insurance and shall take effect within the time set forth in the addendum.

§ 8.12.4 Performance and Payment Bonds

The Contractor shall furnish a Performance Bond and a Labor and Materials Payment Bond with surety approved by the Owner and on the forms approved by the Owner. Each bond shall be in the full amount of the parties' contract and shall be conditioned upon the full and faithful performance of all major terms and conditions of the contract and the payment of all labor and material suppliers. If at any time after the execution of a contract and the surety bonds (in the forms attached hereto) the Owner shall deem any bond surety to be unsatisfactory, or if for any reason, a bond ceases to be adequate to cover the performance of the work or the payment of labor and materials, the Contractor shall, at its expense and within five (5) days after the receipt of notice from the Owner to do so, furnish an additional bond or bonds, in such form and amount, and with such surety or sureties as shall be satisfactory to the Owner. In such event no further payment to the Contractor shall be deemed to be due under this contract until such new or additional security for the faithful performance of the work and the payment of labor and material suppliers shall be furnished in a manner and form satisfactory to the Owner. The corporate surety on any performance or payment bond must be licensed by the State of Missouri and must be listed in United States Treasury Circular 570, and the bonds shall be accompanied by current powers of attorney, on a form acceptable to Owner.

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2017. (State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2017.)

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

All Drawings and Specifications issued as part of the Construction Document Set issued by HTK Architects. See attached Exhibit E for the complete listing.

This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.4 AIA Document C106™–2017, Digital Data Licensing Agreement

.5 Drawings
See attached Exhibit E for the complete listing

.6 Specifications
See attached Exhibit E for the complete listing

.7 Addenda, if any:

Number	Date	Pages
TBD		

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[ ] The Sustainability Plan:

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

Title	Date	Pages

[X] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

Exhibit A: General Conditions AIA 201-2017
Exhibit B: Contract Bid Forms and Bid Bond
Exhibit C: Bid Category Scope of Work
Exhibit D: Modification/Explanation of the Change Order Fee
Exhibit E: Contract Document Log (Drawings and Specifications and Front Ends).

This Agreement entered into as of the day and year first written above.

OWNER (Signature)	CONTRACTOR (Signature)
Dr. Virgil Weideman, President Union R-XI School District Board of Education	TBD
(Printed name and title)	*(Printed name and title)*

Init.

/

AIA Document A101™ – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 09:46:12 ET on 12/03/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA3B)

AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Union R-XI Middle School Classroom Addition

THE OWNER:
(Name, legal status and address)

Union R-XI School District
#1 Wildcat Drive
Union, MO 63084

THE ARCHITECT:
(Name, legal status and address)

HTK Architects, P.A.
9300 W. 110th Street, Suite 150
Overland Park, KS 66210

TABLE OF ARTICLES

1 GENERAL PROVISIONS
2 OWNER
3 CONTRACTOR
4 ARCHITECT
5 SUBCONTRACTORS
6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7 CHANGES IN THE WORK
8 TIME
9 PAYMENTS AND COMPLETION
10 PROTECTION OF PERSONS AND PROPERTY
11 INSURANCE AND BONDS
12 UNCOVERING AND CORRECTION OF WORK
13 MISCELLANEOUS PROVISIONS
14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.
/

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

INDEX
(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work
9.6.6, 9.9.3, 12.3
Acceptance of Work
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3
Access to Work
3.16, 6.2.1, 12.1
Accident Prevention
10
Acts and Omissions
3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2
Addenda
1.1.1
Additional Costs, Claims for
3.7.4, 3.7.5, 10.3.2, 15.1.5
Additional Inspections and Testing
9.4.2, 9.8.3, 12.2.1, 13.4
Additional Time, Claims for
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, 15.1.6
Administration of the Contract
3.1.3, 4.2, 9.4, 9.5
Advertisement or Invitation to Bid
1.1.1
Aesthetic Effect
4.2.13
Allowances
3.8
Applications for Payment
4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10
Approvals
2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1
Arbitration
8.3.1, 15.3.2, 15.4
ARCHITECT
4
Architect, Definition of
4.1.1
Architect, Extent of Authority
2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1
Architect, Limitations of Authority and Responsibility
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2
Architect's Additional Services and Expenses
2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4
Architect's Administration of the Contract
3.1.3, 3.7.4, 15.2, 9.4.1, 9.5
Architect's Approvals
2.5, 3.1.3, 3.5, 3.10.2, 4.2.7
Architect's Authority to Reject Work
3.5, 4.2.6, 12.1.2, 12.2.1
Architect's Copyright
1.1.7, 1.5
Architect's Decisions
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2
Architect's Inspections
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4
Architect's Instructions
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2
Architect's Interpretations
4.2.11, 4.2.12
Architect's Project Representative
4.2.10
Architect's Relationship with Contractor
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2
Architect's Relationship with Subcontractors
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3
Architect's Representations
9.4.2, 9.5.1, 9.10.1
Architect's Site Visits
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Asbestos
10.3.1
Attorneys' Fees
3.18.1, 9.6.8, 9.10.2, 10.3.3
Award of Separate Contracts
6.1.1, 6.1.2
Award of Subcontracts and Other Contracts for Portions of the Work
5.2
Basic Definitions
1.1
Bidding Requirements
1.1.1
Binding Dispute Resolution
8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1
Bonds, Lien
7.3.4.4, 9.6.8, 9.10.2, 9.10.3
Bonds, Performance, and Payment
7.3.4.4, 9.6.7, 9.10.3, 11.1.2, 11.1.3, 11.5
Building Information Models Use and Reliance
1.8
Building Permit
3.7.1
Capitalization
1.3
Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4
Certificates of Inspection, Testing or Approval
13.4.4
Certificates of Insurance
9.10.2
Change Orders
1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2
Change Orders, Definition of
7.2.1
CHANGES IN THE WORK
2.2.2, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5
Claims, Definition of
15.1.1
Claims, Notice of
1.6.2, 15.1.3
CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4
Claims and Timely Assertion of Claims
15.4.1
Claims for Additional Cost
3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, 15.1.5
Claims for Additional Time
3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, 15.1.6
Concealed or Unknown Conditions, Claims for
3.7.4
Claims for Damages
3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7
Claims Subject to Arbitration
15.4.1
Cleaning Up
3.15, 6.3
Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, 15.1.5
Commencement of the Work, Definition of
8.1.2
Communications
3.9.1, 4.2.4
Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2
COMPLETION, PAYMENTS AND
9
Completion, Substantial
3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2
Compliance with Laws
2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3
Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3
Conditions of the Contract
1.1.1, 6.1.1, 6.1.4
Consent, Written
3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2
Consolidation or Joinder
15.4.4
CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
1.1.4, 6
Construction Change Directive, Definition of
7.3.1
Construction Change Directives
1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, 7.3, 9.3.1.1
Construction Schedules, Contractor's
3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Contingent Assignment of Subcontracts
5.4, 14.2.2.2
Continuing Contract Performance
15.1.4
Contract, Definition of
1.1.2
CONTRACT, TERMINATION OR SUSPENSION OF THE
5.4.1.1, 5.4.2, 11.5, 14
Contract Administration
3.1.3, 4, 9.4, 9.5
Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1
Contract Documents, Copies Furnished and Use of
1.5.2, 2.3.6, 5.3
Contract Documents, Definition of
1.1.1
Contract Sum
2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, 9.1, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, 15.1.5, 15.2.5
Contract Sum, Definition of
9.1
Contract Time
1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5
Contract Time, Definition of
8.1.1
CONTRACTOR
3
Contractor, Definition of
3.1, 6.1.2
Contractor's Construction and Submittal Schedules
3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2
Contractor's Employees

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.3, 14.1, 14.2.1.1
Contractor's Liability Insurance
11.1
Contractor's Relationship with Separate Contractors and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4
Contractor's Relationship with Subcontractors
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2, 9.6.7, 9.10.2, 11.2, 11.3, 11.4
Contractor's Relationship with the Architect
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1
Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
2.2.2, 9.7
Contractor's Right to Terminate the Contract
14.1
Contractor's Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3
Contractor's Superintendent
3.9, 10.2.6
Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.3.6, 3.11
Copyrights
1.5, 3.17
Correction of Work
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2, 12.3, 15.1.3.1, 15.1.3.2, 15.2.1
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.4
Costs
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2, 11.3, 14.2.4, 15.1.7
Damages for Delay
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2, 14.2.2, 14.2.4, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, 9.5, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1
Delays and Extensions of Time
3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
Digital Data Use and Transmission
1.7
Disputes
6.3, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2
Emergencies
10.4, 14.1.1.2, 15.1.5
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.3, 14.1, 14.2.1.1
Equipment, Labor, or Materials
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.6, 15.2.5

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

Failure of Payment
9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Faulty Work
(See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.9, 9.8.2, 9.10, 12.3, 14.2.4, 14.4.3
Financial Arrangements, Owner's
2.2.1, 13.2.2, 14.1.1.4
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty)
Hazardous Materials and Substances
10.2.4, 10.3
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.17, 3.18, 9.6.8, 9.10.2, 10.3.3, 11.3
Information and Services Required of the Owner
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5,
9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2,
14.1.1.4, 14.1.4, 15.1.4
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Decisions
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Initial Decision Maker, Extent of Authority
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4
Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
9.9.2, 9.10.1, 12.2.1, 13.4
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2
Instruments of Service, Definition of
1.1.7
Insurance
6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5,
11
Insurance, Notice of Cancellation or Expiration
11.1.4, 11.2.3
Insurance, Contractor's Liability
11.1
Insurance, Effective Date of
8.2.2, 14.4.2
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, 11.2, 11.4, 11.5
Insurance, Stored Materials
9.3.2
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1
Insured loss, Adjustment and Settlement of
11.5
Intent of the Contract Documents
1.2.1, 4.2.7, 4.2.12, 4.2.13
Interest
13.5
Interpretation
1.1.8, 1.2.3, 1.4, 4.1.1, 5.1, 6.1.2, 15.1.1
Interpretations, Written
4.2.11, 4.2.12
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1,
10.2.4, 14.2.1.1, 14.2.1.2
Labor Disputes
8.3.1
Laws and Regulations
1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4,
9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8,
15.4
Liens
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Limitations, Statutes of
12.2.5, 15.1.2, 15.4.1.1
Limitations of Liability
3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6,
4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3,
11.3, 12.2.5, 13.3.1
Limitations of Time
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7,
5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15,
15.1.2, 15.1.3, 15.1.5
Materials, Hazardous
10.2.4, 10.3
Materials, Labor, Equipment and
1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2,
10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2
Means, Methods, Techniques, Sequences and
Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
Mechanic's Lien
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Mediation
8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, 15.3, 15.4.1,
15.4.1.1
Minor Changes in the Work
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1,
7.4
MISCELLANEOUS PROVISION 13

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

Modifications, Definition of
1.1.1
Modifications to the Contract
1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2
Mutual Responsibility
6.2
Nonconforming Work, Acceptance of
9.6.6, 9.9.3, 12.3
Nonconforming Work, Rejection and Correction of
2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2
Notice
1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2., 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1
Notice of Cancellation or Expiration of Insurance
11.1.4, 11.2.3
Notice of Claims
1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, 15.1.3, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1
Notice of Testing and Inspections
13.4.1, 13.4.2
Observations, Contractor's
3.2, 3.7.4
Occupancy
2.3.1, 9.6.6, 9.8
Orders, Written
1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1
OWNER
2
Owner, Definition of
2.1.1
Owner, Evidence of Financial Arrangements
2.2, 13.2.2, 14.1.1.4
Owner, Information and Services Required of the
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
Owner's Authority
1.5, 2.1.1, 2.3.32.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7
Owner's Insurance
11.2
Owner's Relationship with Subcontractors
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2
Owner's Right to Carry Out the Work
2.5, 14.2.2
Owner's Right to Clean Up
6.3
Owner's Right to Perform Construction and to Award Separate Contracts
6.1
Owner's Right to Stop the Work
2.4
Owner's Right to Suspend the Work
14.3
Owner's Right to Terminate the Contract
14.2, 14.4
Ownership and Use of Drawings, Specifications and Other Instruments of Service
1.1.1, 1.1.6, 1.1.7, 1.5, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3
Partial Occupancy or Use
9.6.6, 9.9
Patching, Cutting and
3.14, 6.2.5
Patents
3.17
Payment, Applications for
4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3
Payment, Certificates for
4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4
Payment, Failure of
9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Payment, Final
4.2.1, 4.2.9, 9.10, 12.3, 14.2.4, 14.4.3
Payment Bond, Performance Bond and
7.3.4.4, 9.6.7, 9.10.3, 11.1.2
Payments, Progress
9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4
PAYMENTS AND COMPLETION
9
Payments to Subcontractors
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
PCB
10.3.1
Performance Bond and Payment Bond
7.3.4.4, 9.6.7, 9.10.3, 11.1.2
Permits, Fees, Notices and Compliance with Laws
2.3.1, 3.7, 3.13, 7.3.4.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF
10
Polychlorinated Biphenyl
10.3.1
Product Data, Definition of
3.12.2
Product Data and Samples, Shop Drawings
3.11, 3.12, 4.2.7
Progress and Completion
4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.4
Progress Payments
9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4
Project, Definition of
1.1.4
Project Representatives

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

4.2.10
Property Insurance
10.2.5, 11.2
Proposal Requirements
1.1.1
PROTECTION OF PERSONS AND PROPERTY
10
Regulations and Laws
1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Rejection of Work
4.2.6, 12.2.1
Releases and Waivers of Liens
9.3.1, 9.10.2
Representations
3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1
Responsibility for Those Performing the Work
3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
3.2, 3.12.7, 6.1.3
Review of Contractor's Submittals by Owner and Architect
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12
Rights and Remedies
1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2, 12.2.4, 13.3, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.3.1, 4.2.2, 4.2.7, 5.3, 10.1, 10.2, 10.4
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, 3.12, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Separate Contractors, Definition of
6.1.1
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, 3.12, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4
Site Visits, Architect's
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Special Inspections and Testing
4.2.6, 12.2.1, 13.4
Specifications, Definition of
1.1.6
Specifications
1.1.1, 1.1.6, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14
Statute of Limitations
15.1.2, 15.4.1.1
Stopping the Work
2.2.2, 2.4, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, 11.3
Substances, Hazardous
10.3
Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
2.3.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4
Successors and Assigns

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4
Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6, 9.10.5, 14.2.1
Surety
5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2, 15.2.7
Surety, Consent of
9.8.5, 9.10.2, 9.10.3
Surveys
1.1.7, 2.3.4
Suspension by the Owner for Convenience
14.3
Suspension of the Work
3.7.5, 5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14
Taxes
3.6, 3.8.2.1, 7.3.4.4
Termination by the Contractor
14.1, 15.1.7
Termination by the Owner for Cause
5.4.1.1, 14.2, 15.1.7
Termination by the Owner for Convenience
14.4
Termination of the Architect
2.3.3
Termination of the Contractor Employment
14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT
14
Tests and Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 12.2.1, 13.4
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
Time Limits
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15.1.2, 15.1.3, 15.4
Time Limits on Claims
3.7.4, 10.2.8, 15.1.2, 15.1.3
Title to Work
9.3.2, 9.3.3
UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 9.1.2
Use of Documents
1.1.1, 1.5, 2.3.6, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.3.2
Waiver of Claims by the Contractor
9.10.5, 13.3.2, 15.1.7
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, 15.1.7
Waiver of Consequential Damages
14.2.4, 15.1.7
Waiver of Liens
9.3, 9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, 11.3
Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2, 15.1.2
Weather Delays
8.3, 15.1.6.2
Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3, 13.2, 13.3.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12
Written Orders
1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. The Contract Documents include the INVITATION TO BID, INSTRUCTIONS TO BIDDERS and ADDENDA.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

The Work referred to in these documents consists of the furnishing of all labor, materials and equipment for the complete installation of all work as specified herein and shown on the drawings, including delivery, unloading, uncrating, assembling, setting-in-place, leveling, adjustment, completely installing and cleaning up of any debris.

The Work shall be in strict accordance with the Drawings and Specifications.

The Contractor shall thoroughly investigate all local trade jurisdictional rulings and shall be held completely responsible for the settlement of any disputes arising from fabrication, installation, or completion of the Work under this Contract.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under section 14.2.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.1.9 Site

The term Site refers to that portion of the property on which the Work is to be performed or which has been otherwise set aside for use by the Contractor.

§ 1.1.10 Punch List

The term Punch List means, collectively, unfinished items of the construction of the Project, which unfinished items of construction are minor or insubstantial details of construction, mechanical adjustment or decoration remaining to be performed, the non-completion of which would not materially affect the use of the Project, and which are capable of being completed within Thirty (30) days of Substantial Completion, subject to the availability of special order parts and materials.

§ 1.1.11 Float

Float-Float is a measurement of time indicating how late any activity or group of activities in a schedule can be completed without impacting the critical path and the scheduled end date of the Project. Float belongs to the Project and is not for exclusive use of the Contractor.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 Reference to Standard Specifications of any technical society, organization, or association, or to codes of local or state authorities, shall mean the latest standard, code, specification, or tentative specification adopted and published at the date of taking the bid, unless specifically stated otherwise.

§ 1.2.5 The Contractor shall notify the Architect in writing of any inconsistency found between the Specifications and Drawings. The Architect will then advise the Contractor on whether the Specifications will control.

§ 1.2.6 The terms "this Contractor," "furnished under other sections," "included as part of other sections," "related work in other sections," or similar description of segregation shall not be interpreted to limit the responsibility of any

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

particular party involved in the work. The limitations of any Subcontractor's work shall rest solely upon the agreement between the Contractor and the Subcontractor, regardless of where the work is called for in the Contract Documents.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.4.2 In the event of conflict among various provisions of the Contract Documents, the terms shall be interpreted in the following order of priority:

.1 Modifications to the Contract
.2 The Contract
.3 Special Conditions
.4 General Conditions

Drawings shall control over Specifications, and details in drawings shall control over large-scale drawings.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement..

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data. Drawings in electronic format will not be available for Bidding. Digital data shall be available after award of Contract per AIA Document C106, 2013 Edition, and Section 01330.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements,

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until cause for such order has been eliminated; However, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such cases an appropriate Change Order shall be issued deducting from payments then and thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and Compensation for the Architect's and Owner Representative's additional services made necessary by such default, neglect, or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.5 Architect's Compensation for Services to Remedy Defective Work

When the Architect's and Owner Representative's Additional services are required because of defective work, neglect, failure, deficiencies, or default by the Contractor, the Architect's and Owner Representative's compensation for such services shall be based on the Architect's and Owner Representative's invoice to the Owner. The Invoice, when approved by the Owner, along with other cost, damages and liabilities incurred by the Owner or the Architect, shall be the basis for adjust the Contract Sum, by Change Order, to compensate the Owner for the Architect's and Owner Representative's Additional Services.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor. The Contractor waives any rights, claims or causes of action against Owner as a result of activities or duties of the Architect in the Architect's administration of the Contract or representations made by the Architect in the Design Documents. The Contractor acknowledges any such rights, claims, or causes of action accrue against the Architect and Contractor may see redress from Architect in the event that becomes necessary.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents and has notified the Architect of and obtained clarification of any discrepancies which have become apparent during bidding or proposal period.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require. Insofar as the Contract Documents have been prepared in accordance with applicable laws, statutes, building codes and regulations, the Contractor shall execute the work in accordance with their intent and with said laws, statutes, building codes and regulations. Refer to Section 014200 and other applicable portions of the Contract Documents for specific requirements.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistence or omission in the Contract Documents without such notice to Architect, the Contractor shall thereby assume responsibility for performance and shall bear the attributable cost for correction.

§ 3.2.5 If the Contractor believes that any portions of the Contract Documents do not comply with applicable laws, statutes, ordinances, building codes, and rules and regulations, or any orders by code enforcement officials or the Owner or its designees acting in the capacity of building code inspectors or Referenced Standards, the Contractor must promptly notify the Owner and the Architect of the non-compliance as provided in Section 3.2.6 and request direction before proceeding with the affected Work.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 3.2.6 The Contractor must promptly notify the Owner and the Architect in writing of any apparent errors, inconsistencies, omissions, ambiguities, construction impracticalities or code violations discovered as a result of the Contractor's review of the Contract Documents including any differences between actual and indicated dimensions, locations and descriptions, and must give the Owner and the Architect timely notice in writing of same and of any corrections, clarifications, additional Drawings or Specifications, or other information required to define the Work in greater detail or to permit the proper progress of the Work. The Contractor must provide similar notice with respect to any variance between its review of the Site and the physical data and Site conditions observed.

§ 3.2.7 If the Contractor performs any Work involving an apparent error, inconsistency, ambiguity, construction impracticality, omission or code violate in the Contract Documents of which the Contractor is aware, or which could reasonably have been discovered by the review required by Section 3.2, without prompt written notice to the Owner and the Architect and request for correction, clarification or additional information, as appropriate, the Contractor does so at its own risk and expense and all claims relating thereafter are specifically waived.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.1.1 Products are generally specified by ASTM (American Society of Testing Materials) or other referenced standard, and/or by the manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting the standard by any manufacturer. When several products or manufacturers are specified in being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

skilled in tasks assigned to them. Persons permitted to perform Work under Contractor or any Subcontractor or Sub-Subcontractor shall meet all employment eligibility, safety training, security or drug/alcohol testing requirements required by law or by Owner. Any person not complying with all such requirements shall be immediately removed from the Site.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§3.5.2 The Contractor's general warranty and any additional or special warranties are not limited by the Contractor's obligations to specifically correct defective or nonconforming Work as provided in Article 12, nor are they limited by any other remedies provided in the Contract Documents. The Contractor shall also be liable for any damage to property or persons (including death) including consequential and direct damages relating to any breach of the Contractor's general warranty or any additional or special warranties required by the Contract Documents.

§3.5.3 The Contractor must furnish all special warranties required by the Contract Documents to the Owner no later than Substantial Completion. The Owner may require additional special warranties in connection with the approval of "Or-Equals" or Substitutions, Allowance items, Work that is defective or nonconforming, or the acceptance of nonconforming Work pursuant to Article 12.

§ 3.6 Taxes

3.6.1 The Owner enjoys tax exempt status as a school district. To enjoy the cost-savings benefits of its tax-exempt status, the Owner will provide a Tax Exemption Certificate to the Contractor for use on the Project. The Contractor shall use that Certificate to exempt any purchases made for the Work from taxes. Contractor will pass on all savings for the tax- exempt to the Owner. The Contractor agrees to bind all Subcontractors of any tier to the obligation to present and use the Tax Exemption Certificate and pass all savings to the Owner.

§ 3.6.2 The Contractor will require all Subcontractors and Bidders to provide cost information for materials separate from other costs for labor, profit, overhead, etc. to allow the Owner to verify that no taxes are paid on material procurement and that such savings shall be passed on to the Owner.

§ 3.6.3 The Contractor will maintain all records, invoices, receipts, or other accounting data regarding material purchases and will allow, upon written request of the Owner and within a reasonable time frame after receipt of such request, the Owner to audit such records and verify tax savings. If an audit reveals taxes paid or savings not transferred to the Owner, the Contractor will be liable to the Owner for those amounts and the Owner may back-charge the Contractor for those amounts if a balance of funds due and payable remains at the time of such discovery.

.1 The Contractor will require all Subcontractors of any tier maintain all records, invoices, receipts, or other accounting data regarding material purchases. The Contractor will collect such records with each application for payment it receives from its Subcontractors and shall maintain such records in the same manner and location as the Contractor's records.

.2 The Contractor will ensure its Subcontractors and any lower-tier Subcontractors include these obligations in their contracts and bind themselves in the same manner as the Contractor is bound to the Owner.

§ 3.6.4 The Contractor shall pay sales, consumer, use and similar taxes including unemployment compensation taces for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 When Contractor knows or reasonably should have know Work to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. The Superintendent must provide his or her email address, and cell phone number to the Owner and Architect, and must be available to be contacted during all business hours, and outside of business hours in the event of an emergency. The Superintendent must be fluent in all languages necessary to effectively communicate with Contractor's staff assigned to the Project, and with all Subcontractors, in order to supervise and direct the Work and assist emergency responders.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work within Twenty-One (21) days of execution of the Contract. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extend required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. Thereafter, the Contractor shall prepare and update the construction schedule on a monthly basis ("Current Construction Schedule), if not more frequently at the Contractor's discretion, to be submitted by the Owner with each Application for Payment.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval within Twenty-One (21) days of the execution of Contract. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors. The contractor must provide the Owner and the Architect with copies of all submittals made to regulatory agencies.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect. The Contractor must correct at its cost, and without any adjustment to Contract Time, any Work the correction of which is required due to the Contractor's failure to obtain approval of a submittal required to have been obtained prior to proceeding with the Work, including, but not limited to, correction of any conflicts in the Work resulting from such failure.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.
§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.1 Except as may be specifically provided in the Contract Documents, the Contractor shall provide all necessary temporary facilities, including power, water, sanitation, scaffolding, storage, and security. If Owner makes any such facilities available to the Contractor, it is without representation or warranty as to their adequacy for Contractor's use, and Contractor shall indemnify, defend, and hold Owner harmless from and against any claims arising out of Contractor's use of such facilities.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor on a daily basis shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. Contractor shall provide on-site containers for the collection of waste materials, debris and rubbish, and shall periodically remove waste materials, debris and rubbish from the Work and dispose of all such materials at legal disposal areas away from the site. All cleaning operations shall be scheduled so as to ensure that contaminants resulting from the cleaning process will not fall on newly-coated or newly-painted surfaces. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project. Immediately after unpacking materials, all packing case lumber or other packing materials, wrapping or other like flammable waste shall be collected and removed from the building and premises. Care shall be taken by all workers not to mark, soil, or otherwise deface any finish. In the event that any finish becomes defaced in any way by mechanics or workers, the Contractor or any of his Subcontractors shall clean and restore such surfaces to their original condition.

§ 3.15.2 The Contractor must keep the Site and adjacent areas free from accumulation of waste materials or rubbish caused by the operations under the Contract on a daily basis, and must keep tools, construction equipment, machinery and surplus materials suitably stored when not in use. If the Contractor fails to do so in a manner reasonably satisfactory to the Owner or the Architect within Forty-Eight (48) hours after notice or as otherwise required by the Contract Documents, the Owner may clean the Site and back charge the Contractor for all costs associated with the cleaning. At Completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.3 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 3.15.4 The Contractor shall be responsible for the protection of the Work. Prior to the Architect's inspection for Substantial Completion, the Contractor shall clean exterior and interior surfaces exposed to view; remove temporary labels, stains, putty, soil, paint and foreign substances from all surfaces, including glass and painted surfaces; polish transparent and glossy surfaces; clean equipment and fixtures to a sanitary condition; replace air filters in mechanical equipment; clean roofs, gutters, and downspouts; remove obstructions and flush debris from drainage systems; clean site; sweep paved areas and rake clean other surfaces; remove trash and surplus materials from the site; clean and polish all floors; clean and polish all hardware; and repair all Work damaged during cleaning.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 The Contractor shall defend, indemnify, and hold harmless the Owner, its elected or appointed officials, Architect, Owner's Representative, and their respective consultants, insurers, agents, and employees, from and against any and all liability, suits, damages, costs (including attorney fees), losses, outlays and expenses from claims in any manner caused by, or allegedly caused by, or arising out of or connected with, the Contract, or the work of any subcontract hereunder (the Contractor hereby assuming full responsibility for relations with Subcontractors), including but not limited to claims for personal injuries, death, or property damage (other than the Work itself), regardless of whether the loss to be indemnified was caused in part by an indemnified person.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.18.3 Notwithstanding Subparagraph 3.18.1 General Conditions, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, Owner's Representative and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorney's fees arising from or resulting from blasting activities at the site of the Work, irrespective of the degree of care utilized by the Contractor, or Subcontractor, or anyone directly or indirectly employed by them, in the course of performing those blasting activities.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Owner shall retain an Architect lawfully licensed to practice Architecture or an entity lawfully practicing Architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 4.2.1.1
If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work except for acts or omissions where the Architect knew yet failed to report to the Owner.

§ 4.2.4 Communications
The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect shall reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and make recommendations concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations or recommendations of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and recommendations, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

§ 4.2.15 All Parties to this agreement believe the use of electronic communications is a beneficial method of communication. As such, all parties agree that any communication thru electronic means (Email, project web site, Procore, etc.) will be consider a valid form of communication as set forth in this agreement. All parties agree that electronic email communications will constitute notice and any person sent an email will be considered to have been duly served as set forth in this agreement.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, within thirty (30) days after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection. The Contractor shall update this list throughout the Project and keep Owner and Architect advised of any new Subcontractors employed.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Sub-contractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Change Proposals

The Contractor must submit change proposals covering a contemplated Change Order within ten (10) days after the request of the Owner or the Architect or within ten (10) days of the event giving rise to the Contractor's claim for a change in the Contract Sum or Contract Time. No increase in the Contract Sum or extension of the Contract Time will be allowed the Contractor for the cost or time involved in making change proposals. Change proposals will define or confirm in detail the Work that is proposed to be added, deleted, or changed and must include any adjustment which the Contractor believes to be necessary in the Contract Sum or the Contract Time. Any proposed adjustment must include detailed documentation, including but not limited to: cost, properly itemized and supported by sufficient substantiating data to permit evaluation including cost of labor, materials, supplies and equipment, rental cost of machinery and equipment, and additional bond cost. Change proposals will be binding upon the Contractor and may be accepted or rejected by the Owner in its discretion. The Owner may, at its option, instruct the Contractor to proceed with the Work involved in the Change Proposal in accordance with this Section 7.2.2 without accepting the Change Proposal in its entirety. See Exhibit D, entitled Modifications/Explanations or the Change Order Fee, which shall govern and apply to Change Orders.

§ 7.2.3 If the Owner determines that a change proposal is appropriate, the Architect will prepare and submit a request for a Change Order or Contract Amendment providing for an appropriate adjustment in the Contract Sum or Contract Time, or both, for further action by the Owner. No such change is effective until the Owner and Architect sign the Change Order.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, (after the scope has been previously approved in writing by the Owner), directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change, plus a reasonable credit for overhead and profit, but in no case less than 75% of the amount which would be included for an increase in the Contract Sum, unless otherwise substantiated by the Contractor and approved by the Architect.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time. If Contractor's work shall fall behind schedule for reasons that are not excused under the terms of the Contract, Contractor shall add additional workers or shifts, and/or work overtime as necessary to maintain the Construction Schedule.

§ 8.2.4 The Contractor must conform to the most recently approved Construction Schedule. The Contractor must complete the indicated work or achieve the required percentage of completion, as applicable, with any interim completion dates established in the most recently approved Construction Schedule.

§ 8.2.5 The Contractor must maintain at the Site, available to the Owner and the Architect for their reference during the progress of the Work, a copy of the approved Construction Schedule and any approved revisions thereto. The Contractor must keep current records of and mark on a copy of the approved Construction Schedule the actual commencement date, progress, and completion date of each scheduled activity indicated on the Construction Schedule.

§ 8.2.6 The Contractor represents that its bid includes all costs, overhead and profit which may be incurred throughout the Contract Time and the period between Substantial and Final Completion. Accordingly, the Contractor may not make any claim for delay damages based in whole or in part on the premise that the Contractor would have completed the Work prior to the expiration of the Contract Time but for any claimed delay.

§ 8.2.7 If the Contractor's progress is not maintained in accordance with the approved Construction Schedule, or the Owner determines that the Contractor is not diligently proceeding with the Work or has evidence reasonably indicating that the Contractor will not be able to conform to the most recently approved Construction Schedule, the Contractor must, promptly and at no additional cost to the Owner, take all measures necessary to accelerate its progress to overcome the delay and ensure that there will be no further delay in the progress of the Work and Notify the Owner.

§ 8.2.8 The Owner reserves the right to issue a written directive to accelerate the Work that may be subject to an appropriate adjustment, if any, in the Contract Sum. If the Owner requires an acceleration of the Construction Schedule and no adjustment is made in the Contract Sum, or if the Contractor disagrees with any adjustment made, the Contractor must file a claim as provided in Article 15 or the same will be deemed to be conclusively waived.

§ 8.3 Delays (Not the Fault of the Contractor) and Extensions of Time

§ 8.3.1 Excusable delays are delays in the progress of the Work which at the time of the delays were critical path activities shown on the most recently approved Construction Schedule and which prevent the Contractor from achieving Substantial Completion before the expiration of the Contract Time, which are caused by conditions that could not reasonably be anticipated by, are beyond the control of, and are without the fault or negligence of the Owner, as set forth in Section 8.3.2, the Contractor, or anyone for whose acts the Contractor is responsible. Excusable delays do not include delays caused in whole or in part by any Subcontractors, Sub-subcontractors or

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

suppliers. Excusable delays may justify an extension of the Contract Time, but there shall be not compensation whatsoever for excusable delays. Excusable delays may, but do not necessarily, include:

.1 Weather delays as further defined in Section 8.3.6;
.2 Acts of Government or regulatory agencies and officials (Other than the Owner in its capacity as Owner;)
.3 Catastrophic events such as fire, flood and unavoidable casualties; and
.4 Strikes or labor disputes.

§ 8.3.2 Compensable delays are limited to delays in the progress of the Work which at the time of the delays were critical path as shown on the most recently approved Construction Schedule and which prevent Contractor from achieving Substantial Completion before the expiration of the Contract Time, which are caused solely and exclusively by acts or omissions of the Owner (except actions taken by the Owner acting as a regulatory authority to protect the public health or safety or to conform to law).

§ 8.3.3 Unexcused delays are delays in Work which at the time of the delays were critical path activities as shown on the most recently approved Construction Schedule and which prevent the Contractor from achieving Substantial Completion before the expiration of the Contract time and which are not excusable delays or compensable delays. No increase in the Contract Sum or extension of the Contract Time will be made for an unexcused delay.

§ 8.3.4 The Contractor must provide written notice of any actual or prospective delay promptly, and in no event later than five (5) days after the occurrence of the event giving risk to such delay. The notice must be given to the Owner and Architect within the specified time. In the case of a Continuing delay, the Contractor must provide an initial notice and a further notice at each progress meeting throughout the duration of the delay. The notice must contain all of the specific information specified in Section 8.3.5. The Contractor's failure to provide the written notice containing the information specified in Section 8.3.5 within five (5) days prescribed above will be conclusively deemed a waiver or any claim for delay arising from such occurrence.

§ 8.3.5 The Contractor's notice must identify those portions of the Construction Schedule affected by the delay and must include an estimate of the cost and probable effect of the delay, if any, on the progress of the Work. Supporting documentation must include, but is not limited to:

.1 a written detailed statement of the reasons and causes for the delay;

.2 inclusive dates of the delay;

.3 specific trades and portions of the Work affected by the delay;

.4 status of Work affected before commencement of the delay;

.5 effect of the delay on available Float;

.6 a critical path method (CPM) analysis demonstrating that the delay has affected an activity then on the critical path at the time of the occurrence of the delay as shown on the most recently approved Construction Schedule; and

.7 if the Contractor claims that the delay is an excusable delay or compensable delay, evidence that the delay was unforeseeable, beyond the Contractor's control, and without the fault or negligence of the Contractor or the negligence of anyone for whose acts the Contractor is responsible, including any Subcontractor, Sub-subcontractor or supplier; and in the case of a compensable delay, was caused solely and exclusively by the acts or omissions of the Owner (excepting actions taken by the Owner to protect the public health or safety or to conform to law) or anyone for whose acts the Owner is responsible, and which are unreasonable under the circumstances involved and not reasonably within the contemplation of the parties.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 8.3.6 In order for the Contractor to be entitled to an extension of the Contract Time for unusually severe weather, the following conditions must be satisfied:

.1 The weather experienced at the Site during the Contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the Project location during any given month;

.2 The unusually severe weather must delay Work which at the time of the unusually severe weather was a critical path activity as shown on the most recently approved Construction Schedule and which prevents the Contractor from achieving Substantial Completion before expiration of the Contract Time. The delay must be beyond the control and without the fault or negligence of the Contractor. For example, the impacted critical activity must not have occurred during unusually severe weather due to previous unexcused delays; and

.3 The Contractor must have provided written notice of the weather-related delay complying with Sections 8.3.4 and 8.3.5 above.

This contract must achieve substantial completion within (246) calendar days from the Date of Commencement of the Work and within that duration, this Contractor must include an allowance of twenty-five (35) work days for delays due to weather.

Upon acknowledgement of the Notice to Proceed and continuing throughout the Contract, the Contractor must record on the daily superintendent report the occurrence of adverse weather and resultant impact to normally scheduled Work. Actual adverse weather delay days must prevent Work on critical path activities for fifty (50) percent or more of the Contractor's scheduled workday. The number of actual adverse weather delays must include Contractor's scheduled workdays impacted by actual adverse weather (even if the adverse weather occurred in the previous month), be calculated chronologically from the first to the last day each month, and be recorded as full days. If the Contractor has complied with Sections 8.3.4 and 8.3.5 and the provisions of this Section 8.3.6 and the number of actual adverse weather delay workdays exceeds the number of days anticipated above and have adversely affected critical path weather-dependent activities, the Contractor is entitled to a Modification of the Contract Time but not the Contract Sum.

§ 8.3.7 To be considered as the basis for an excusable delay, strikes or labor disputes must be documented by data evidencing (i) the trades directly and indirectly involved in or affected by the strike or labor dispute, (ii) reasons for the strike or labor dispute, (iii) the onset and duration of the strike or labor dispute, and (iv) the measures taken by the Contractor to avoid or overcome the effects of any delay.

§ 8.3.8 Upon receipt of a notice from the Contractor of the occurrence of a delay complying with Sections 8.3.4 and 8.3.5 (and if applicable 8.3.6 and 8.3.7), the Owner will review the most recently approved Construction Schedule to determine (i) whether the delay is in fact an excusable or compensable delay, and (ii) whether any adverse effects of the delay can be overcome by an adjustment in the Construction Schedule, including the application of any unused Float available in the schedule. The Owner may require the Contractor to submit a more detailed Construction Schedule than previously required in order to permit the Owner to evaluate the delay. Based on such review, the Contractor must, if required by the Owner, submit for the Owner's approval a revised Construction Schedule that minimizes the adverse effects of the delay.

§ 8.3.9 No extension of the Contract Time or increase in the Contract Sum will be allowed for any delay or part thereof occurring more than ten (10) days before written notice of the delay is provided by the Contractor. No

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

extension of the Contract Time or increase in the Contract Sum will be made to the extent that performance is, was or would have been suspended, delayed, or interrupted by another cause for which the Contractor is responsible. No

increase in the Contract Sum will be made to the extent performance was or would have been suspended, delayed or interrupted by another cause for which the Owner is not solely and exclusively responsible.

§ 8.3.10 The Contractor will not receive any compensation for profit, additional bond cost, overhead (which includes extended office overhead and site-specific overhead and general conditions), or any other cost or compensation or any other damages of any kind or nature whatsoever whether incurred by the Contractor, its Subcontractor or suppliers for delay, all of which are irrevocably waived by Contractor where the delay results from performance of additional Work (Change Order or Construction Directive) beyond the Work required by the Contract Documents and for which the Contractor is paid for the additional Work.

§ 8.3.11 The Contractor acknowledges and agrees that the profit, additional bond cost and overhead (which includes extended office overhead and site-specific overhead and general conditions) if any, incurred by the Contractor in performing work beyond the Work required by the Contract Documents and any and all other costs, compensation or damages due Contractor (including any of its Subcontractors or suppliers), is included in, and payable to the Contractor as part of the Change Order or Construction Directive. Contractor waives any and all other damages and cost of any nature or kind whatsoever including claims for local and cumulative impacts as a result of such Change Order or Construction Directive Work and any and all other claims of any type or nature whatsoever including any claim for loss of productivity or loss of efficiency. The Contractor will be compensated for compensable delays only for actual and direct damages resulting from such compensable delays. Actual direct damages are limited to site specific general conditions and do not include any indirect costs such as home office overhead. The Contractor will be compensated for such actual and direct damages for compensable delays not attributable to performance of Change Order. Work for which the Contractor is not otherwise compensated in an amount not to exceed the lesser of

(i) a daily rate computed by dividing eight percent (8%) of the original Contract Sum by the original Contract Time or (ii) a daily rate computed by dividing the Contractor's profit, bond cost and site-specific overhead (but not home office overhead) for the original Contract Sum by the original Contract Time. The Contractor for itself and its Subcontractors and suppliers, irrevocably waives any and all other compensation and delay damages as a result of any compensable delays, including without limitations any claims for any indirect cost and any claims for loss of productivity or loss of efficiency.

§ 8.3.12 In the event the Owner denies the Contractor's request for a change in the Contract Time or, in the case of a compensable delay, a change in the Contract Sum, the Contractor may, within ten (10) days after such denial, submit a Claim as provided in Article 15. Submissions made prior to the denial must be resubmitted after the denial. Any Claim on account of denial of a change that is not made within such ten (10) days of the denial is deemed waived.

§ 8.3.13 Delay Damages

.1 By executing a Change Order or Contract Amendment, the Contractor represents that the Contractor is not entitled to an increase in the Contract Sum or an extension of the Contract Time beyond that specified in the Change Order or Contract Amendment for the Work performed or to be performed under the Change Order. The Contractor is not entitled to an increase in the Contract Sum or extension of the Contract Time as a result of the issuance by the Owner of Construction Directive unless the Contractor asserts a claim as required by this Article 8 and Article 15;

.2 No charges or claims for damages may be made by the Contractor or paid to the Contractor for

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

any delay, disruption, inefficiency, interference or hindrance from any cause whatsoever, whether foreseeable or not, including (i) acts or omissions by the Owner, its agents, employees or consultants, (ii) Contract Documents that are negligently prepared or contain inaccurate statements, or (iii) force majeure and circumstances beyond the Contractor's control. The sole remedy for delays, disruptions or hindrances will be non-compensable time extensions for completion of the Work;

.3 The provisions of the Section 8.3.13.1 and Section 8.3.13.2 do not apply to claims that meet all of the following conditions: (i) the claim arises under the Contract; (ii) the claim is limited to actual and direct damages (i.e. profit, additional bond costs (if any) and overhead (only site-specific overhead and not including home office overhead)) incurred as a result of a delay in completing the Project which the Contractor acknowledges are fully compensated for by payment of the adjustment amount specified in Section 8.3.11; (iii) the Contract establishes a time limit for achieving Substantial Completion and the claim is for critical path delays that prevent achievement of Substantial Completion of the Contract within that time limit; (iv) the delay for which damages are claimed is caused solely and exclusively by the Owner (except when acting as a regulatory authority) or anyone for whom they are responsible; (v) the delay is not caused by actions taken by the Owner to protect the public health or safety or to conform to law; and (vi) the Contractor has fully complied with Sections 8.3.4 and 8.3.5; and

.4 A time extension may be granted only for an excusable delay that is beyond the Contractor's control and occurs without the Contractor's fault or negligence. No time extension will be granted in the absence of a written claim for the time extension complying with Sections 8.3.4 and 8.3.5 (and if applicable, 8.3.6 and 8.3.7).

§ 8.3.14 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

(Paragraph Deleted)

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 The Contractor must submit to the Architect itemized Applications for Payment for Work completed on a monthly basis in accordance with a schedule approved by the Owner. Each Application for Payment must be consistent with the approved Schedule of Values. In order to expedite the review and approval of Applications for

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

Payment, the Contractor may submit to and review with the Architect and Owner a draft Application for Payment at a progress meeting prior to submitting a formal Application for Payment.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 The form of Application for Payment must be AIA Document G702, Application and Certificate for Payment, supported by AIA Document G703, Continuation Sheet (latest edition), or such other form as may be prescribed by the Owner. The application must be notarized and supported by sufficient data to demonstrate the Contractor's right to payment and compliance with the payment provisions of the Contract to the satisfaction of the Owner and Architect, such as copies of requisitions from Subcontractors and material suppliers, partial lien waivers, releases and other documents. Each Application for Payment must reflect approved Contract Modifications and the Contract retainage provided for in the Contract Documents.

§ 9.3.3 Applications for Payment may include materials and equipment delivered and suitably stored at the Site for subsequent incorporation in the Work. The Owner has no obligation or responsibility to pay for materials stored off the Site. If specifically approved in writing in advance by the Owner, an Application for Payment may include materials and equipment stored off the Site at a location agreed upon in writing. Payment for materials and equipment stored on or off the Site is conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to protect the Owner's interests. Payment for materials and equipment stored off the Site will, in addition, be conditioned upon the Contractor's provision of applicable insurance, storage and transportation to the Site. Contractor shall indemnify and hold harmless from any liens, claims, security interests or encumbrances filed by the Contractor, Subcontractors, or anyone claiming by, through or under the Contractor or Subcontractor for items covered by payments made by the Owner to the Contractor.

§ 9.3.4 Under applicable provisions of Missouri law, payments received by the Contractor are held in trust for Subcontractors and suppliers who have furnished labor and materials covered by an Application for Payment. Accordingly, Applications for Payment may not include requests for payment of amounts for Work performed by a Subcontractor or Supplier that the Contractor does not intend to pay for said work.

§ 9.3.5 Until the conditions set forth in this Section have been satisfied by Contractor, the amount of each monthly Application for Payment must include the value of each line item as indicated on the approved Schedule of Values, to the extent completed, less Contract retainage of five percent (5%). The retainage will not be paid to the Contractor until thirty (30) days after all of the following conditions have been satisfied: (A) the Contractor has fully performed the Contract; (B) the Contractor has completed all Punch List items to the satisfaction of the Owner and the Architect; (C) the Contractor has delivered to the Owner all Project close-out documents in duplicate, including (1) all maintenance and operating manuals; (2) marked sets of as-built drawings; (3) all guarantees and warranties required under the Contract Documents; (4) a list of names, addresses, and telephone numbers for all subcontractors and others providing guarantees and warranties; and (D) the applicable governmental authorities have issued to the Owner the final use and occupancy permit for the Project.

§ 9.3.6 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. By submitting an Application for Payment, the Contractor further warrants that all Work for which payments have previously been received from the Owner are free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities having provided labor, materials and equipment relating to the Work.

§ 9.3.7 Before the Contractor receives a progress payment, the Contractor must certify in writing that, in accordance with contractual arrangements, Subcontractors and suppliers:

.1 have been paid from the proceeds of previous progress payments; and
.2 will be paid in a timely manner from the proceeds of the progress payment currently due.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

In the event the Contractor has not paid or does not pay as certified, such failure constitutes a ground for termination under Section 14.2 of the Contract. Contractor shall submit Applications for Payment to Architect on a monthly basis or as otherwise specified in the Contract Documents. Once the Architect submits a completed Application for Payment with its Certificate of Payment to the Owner, the Owner within twenty-one (21) days after its receipt of a Request for Payment from the Architect, shall pay the approved amount contained in the Request for Payment to the Contractor.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 Within Thirty (30) days of receipt by the Architect of the Application for Payment, the Owner shall make payment of the amount certified. The Architect may decline to approve any Application for Payment and the Owner shall not be required to make any Progress Payments or Final Payments to the Contractor if the Contractor is in violation of any term or condition of this Agreement, the General Conditions of the Contract (AIA Document A201), or the Supplementary Conditions, or if the Contractor fails to timely provide any information reasonably requested by Owner.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers' amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law. The Contractor will obtain performances and payment bonds in an amount reasonably acceptable to Owner.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Owner does not pay the Contractor within Sixty (60) days after the Contractor submits an Application for Payment to the Architect, the Contractor may file a claim in accordance with Article 15 of this Contract.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work is substantially complete and that items remaining to be completed or corrected can be accomplished within another thirty (30) days, subject to the availability of special-order parts and materials, the Contractor must give written notice to the Owner and the Architect and request an inspection of the Work as provided in Section 9.8.3. The Contractor's notice and request for an inspection must be accompanied by a comprehensive Punch List describing all items to be completed or corrected before final Completion and the submittals required by Section 9.8.2. The Contractor must proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the Contractor's responsibility to complete all Work in accordance with the Contract Documents.

§ 9.8.2.1 In addition to the Punch List, the Contractor must submit the following with its request for a determination of Substantial Completion:

.1 final test reports as required by the Contract and certificates of inspection and approval required for use and occupancy;
.2 Fire Marshall's report;
.3 approvals from, and transfer documents for, all utilities;
.4 Warranties and Guarantees as provided in this Contract;
.5 final, approved operating and maintenance manuals;
.6 all documents and verification of training required by the Contract; and
.7 Schedule to complete the Punch List and value of Work not yet complete.

§ 9.8.3 Upon receipt of the Punch List, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete and whether remaining items can be completed or corrected within thirty (30) days, subject to the availability of special-order parts and materials. The Owner may make a similar inspection. If such inspection discloses any item, whether or not included on the Punch List, which, in the opinion of the Owner or the Architect, (i) must be completed or corrected before the Work can be occupied or used for its intended purpose, or (ii) cannot be completed or corrected within thirty (30) days, subject to the availability of special-order parts and materials, the Architect will so advise the Contractor, and the Contractor must promptly complete or correct such item.

§ 9.8.4 Following the inspection and completion or correction of Work required by the Owner or the Architect before issuance of a Certificate of Substantial Completion, the Contractor must notify the Owner and Architect and request another inspection by the Owner and the Architect to determine Substantial Completion. The Contractor must submit a revised Punch List with such notice. The Architect will promptly notify the Contractor if the Owner or the Architect do not concur that the Work is substantially complete. In such case, the Contractor must bear the cost of any additional services of the Owner or the Architect until the Work is determined to be Substantially Complete.

§ 9.8.5 When the Owner and the Architect concur that the Work is Substantially Complete and that Work remaining to be completed or corrected can be accomplished within a period of thirty (30) days, subject to the availability of special-order parts and materials, the Architect will prepare a Certificate of Substantial Completion and a revised Punch List. The Certificate of Substantial Completion will fix the Date of Substantial Completion and the time periods within which the Contractor must finish all items on the Punch List accompanying the Certificate.

§ 9.8.6 The Certificate of Substantial Completion and accompanying Punch List must be submitted to the Owner and Contractor for execution, which will constitute their written acceptance of responsibilities assigned to them in such Certificate.

§ 9.8.7 To the extent provided in the Contract Documents or in the Certificate of Substantial Completion, the Owner, upon execution of the Certificate, will assume responsibility for security, operation, safety, maintenance, heat, utilities, damage to the Work (other than damage caused by the Contractor) and insurance.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 9.8.8 Warranties required by the Contract Documents will commence on the Date of Substantial Completion of the Work unless otherwise provided in the Certificate of Substantial Completion or the Contract Documents.

§ 9.8.9 Upon execution of the Certificate of Substantial Completion, the Contractor will deliver custody and control of such Work to the Owner. The Owner will thereafter provide the Contractor reasonable access to such Work to permit the Contractor to fulfill the correction, completion and other responsibilities remaining under the Contract and the Certificate of Substantial Completion.

§ 9.8.10 Unless otherwise provided in the Certificate of Substantial Completion, the Contractor must complete or correct all items included in the final Punch List within thirty (30) days, subject to the availability of special-order parts and materials, after the Date of Substantial Completion.

§ 9.8.11 At the time of Substantial Completion, in addition to removing rubbish and leaving the building "broom clean," the Contractor must replace any broken or damaged materials, remove stains, spots, marks and dirt from decorated Work, clean all fixtures, vacuum all carpets and wet mop all other floors, replace HVAC filters, clean HVAC coils, and comply with such additional requirements, if any, which may be specified in the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§9.10.1 When the Contractor has completed or corrected all items on the final Punch List and considers that the Work is complete and ready for final acceptance, the Contractor must give written notice to the Owner and the Architect and request a final inspection of the Work as provided in Section 9.10.2. The Contractor's notice and request for a final inspection must be accompanied by a final Application for Payment and the Submittals required by Section 9.10.3.

§ 9.10.2 Upon receipt of the Contractor's notice and request for final inspection, the Owner and the Architect will promptly make such inspection and, when the Owner and the Architect concur that the Work has been fully completed and is acceptable under the Contract Documents, the Architect will issue a Certificate of Final Completion to the Owner. The Contractor's notice and request for final inspection constitutes a representation by the Contractor to the Owner that the Work has been completed in full and in strict accordance with the terms and conditions of the Contract Documents. The Architect will promptly notify the Contractor if the Owner or the Architect do not concur that the Work is finally complete. In such case the Contractor must bear the cost of any additional services of the Owner or the Architect until the Work is determined to be finally complete.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 9.10.3 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect:

.1 an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner), have been paid or otherwise satisfied, submitted on AIA Document G706, Affidavit of Payment of Debts and Claims (latest edition) or such other form as may be prescribed by the Owner;

.2 a release or waiver of liens on behalf of the Contractor and a similar release or waiver on behalf of each Subcontractor and supplier, accompanied by AIA Document G706A, Affidavit of Release of Liens (latest edition) or such other form as may be prescribed by the Owner;

.3 a certificate evidencing that the Contractor's liability insurance and Performance Bond remain in effect during the one-year correction period following Substantial Completion as set forth in Section 12.2.2.1 and 12.2.2.2;

.4 a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents;

.5 consent of surety to final payment, submitted on AIA Document G707 (latest edition) or other form prescribed by the Owner;

.6 other data required by the Owner establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be prescribed by the Owner;

.7 a certified building location survey and as-built site plan in the form and number required by the Contract Documents;

.8 all warranties and bonds required by the Contract Documents;

.9 Record Documents as provided in Section 3.11and return of Contract Documents as provided therein; and

.10 attic stock items as required by the Contract Documents; and

.11 as applicable, documentation of approval by the AHJ/Sewer District of all Storm Water Management (SWM) work as to allow closeout of the SWM Permit. AHJ/Sewer District approval will be based on satisfying all Permit requirements including the submission of acceptable as-built SWM drawings and other required SWM documents.

(Paragraph Deleted)

§ 9.10.4 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

§ 9.11 CONTRACTOR'S ACKNOWLEDGEMENT AND CERTIFICATION

§ 9.11.1 With each pay application, the Contractor shall provide Owner with a statement under oath certifying that Contractor has paid all subcontractors the sums due and owing to Subcontractors as evidenced by prior Applications for Payment. Contractor shall not be entitled to receive any further payments pursuant to the Agreement unless and until Contractor is in compliance with the terms of this paragraph. Contractor acknowledges the right of Owner to advise subcontractors and sub-subcontractors that Owner has made a Progress Payment or has made Final Payment to the Contractor.

§ 9.12 LIQUIDATED DAMAGES

§ 9.12.1 The Contractor and the Contractor's surety, if any, shall be liable for and shall pay the Owner the sums hereinafter stipulated as liquidated damages for each calendar day of delay following the established contract completion date until the Work is substantially complete. Such sum shall be deducted from the contract amount by contract change order or directive prior to the final payment.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§9.12.2 Liquid Damages Amount per Calendar Day: $1,500 (ONE THOUSAND AND FIVE HUNDRED DOLLARS)

§9.12.3 Reference also Article 3 of AIA101- 2017.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 All persons at the Site and other persons who may be affected by the Work or other operations of the Contractor;

.2 The Work and materials and equipment to be incorporated therein or otherwise utilized in the performance of the Contract, whether in storage on or off the Site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

.3 other property at the Site or adjacent thereto and not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor must implement and maintain compliance with, as required by the Contract Documents, applicable laws and regulations and orders of public authorities having jurisdiction (without limitation OSHA and the State of Missouri), manufacturers' instructions or recommendations, existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including issuing appropriate notices, distributing material safety data sheets and other hazard communication information, providing protective clothing and equipment, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 The Contractor must not load nor permit any part of any structure at the Site to be loaded or subjected to stresses or pressures so as to endanger its safety or that of adjacent structures or property

§ 10.2.5 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.6 If the Contractor suffers injury or damage to person or property because of an act or omission of the Owner, or of any of the Owner's employees or agents, or of others for whose acts it is contended that the Owner is liable, written notice of such injury or damage, whether or not insured, must be given to the Owner within a reasonable time not exceeding ten (10) days after the onset or occurrence of such damage or injury or such shorter time as may be required by the Occupational Safety Hazards Administration (OSHA). The notice must provide sufficient detail to enable the Owner to investigate the matter. If notice is not received by the Owner within the time specified, any claim arising from the occurrence will be deemed to be conclusively waived, except to the extent of any applicable insurance (excluding self-insurance) coverage covering such occurrence. The provisions of this Section may not be used by the Contractor in lieu of the requirements of Article 7 when the Contractor is seeking an adjustment in the Contract Sum and are in addition to the requirements of Article 8 when the Contractor is seeking an adjustment in the Contract Time.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 10.2.7 The Contractor must promptly remedy, at its sole cost and expense, damage and loss to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable, unless otherwise instructed in writing by the Owner. This obligation is in addition to, and not in limitation of, the Contractor's obligations for indemnification under Section 3.18 and the Contractor's responsibility to repair and or replace that portion of the Work and any materials and equipment to be incorporated therein which are damaged as a result of criminal mischief as specified in Section 10.2.10.

§ 10.2.8 The Contractor is responsible for taking all reasonable and necessary precautions to secure and protect the Site, the Work, materials and equipment to be incorporated therein, and any tools or equipment of the Contractor necessary or beneficial to the performance of the Work from damage due to vandalism, theft, or other criminal mischief. The Contractor must repair and/or replace that portion of the work and any materials or equipment to be incorporated therein and any tools or equipment of the Contractor necessary or beneficial to performance of the Work which are damaged or stolen due to vandalism, theft or any other criminal mischief at its expense whether or not covered by insurance. No extension of the Contract Time or increase in the Contract Sum will be granted to the Contractor as a consequence of any delay, impacts or inefficiencies resulting from any act of vandalism, theft or other criminal mischief whether or not caused or contributed to by the Contractor's negligence.

§ 10.2.9 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.10 If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party as soon as possible. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.11 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.12 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.13 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.14 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.15 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 10.2.16 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing within 24 hours of discovery.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.3.7 The Work shall be asbestos free. The Contractor, if requested, shall provide certification which attests to same. Reference in the technical specifications to manufacturers, model numbers, equipment, material, article or process shall be regarded as establishing a standard of quality and/or function. The Contractor shall submit a request for substitution on any item which cannot be certified to be asbestos free.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor must take all necessary action, without the necessity for any special instruction or authorization from the Owner or Architect, to prevent threatened damage, injury or loss. The Contractor must promptly, but in all events within twenty-four (24) hours of the emergency, report such action in writing to the Owner and Architect. If the Contractor incurs additional costs on account of or is delayed by such emergency, the Contractor may request a change in the Contract Sum or Contract Time to account for such additional costs or delay in accord with Articles 7, 8 and 15. The Contractor must file any such request within ten (10) days of the emergency or it is deemed waived. Any adjustment in the Contract Sum or Contract Time shall be limited to the extent that the emergency work is not attributable to the fault or neglect of the Contractor or otherwise the responsibility of the Contractor under the Contract Documents.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Liability Insurance

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 Claims for bodily injury or property damage arising out of completed operations; and

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Liability Insurance

§ 11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual Liability Insurance.

§ 11.3 Property Insurance

§ 11.3.1 The Owner shall purchase and maintain property insurance written on a builder's risk "all-risk" or equivalent policy form as required by Section 10.1.2 (e)) of the executed AIA Document A101-2007, Standard Form

of Agreement Between Owner and Contractor. Such coverage shall be in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in

Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, to the extent commercially available and without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, tornadoes or other windstorms, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.3 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.4 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3.4 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, **and the Owner and Contractor shall be named insureds**

§ 11.3.5 Waivers of Subrogation

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate Contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.4.1 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Contractor may, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.4.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.4.3 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 11.6 PERFORMANCE BOND AND PAYMENT BOND

§ 11.6.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100 percent of the Contract Sum.

§ 11.6.1.1 The Contractor shall furnish the required bonds as stipulated in the Instructions to Bidders.

§ 11.6.1.2 The Contractor shall require the attorney-in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

§ 11.6.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.2.6 All warranties required by the Contract Documents shall commence on the date of Substantial Completion of the work or designated portions thereof, or for work first completed after Substantial Completion, on the date of it's acceptance, unless some other commencement date is specifically referenced elsewhere in the contract documents for a specific warranty. The Contractor shall be required to secure any extended warranties or special riders to standard warranties which are required to comply with these requirements.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be affected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by, and construed in accordance with, the laws of the State of Missouri without regard to its conflict of law's provisions. Any litigation shall be conducted in state district court. Mandatory and exclusive venue for any disputes shall be in Franklin County, Missouri.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Paragraph Deleted)

§ 13.6 Equal Employment Opportunity

§ 13.6.1 The Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, or age. The Contractor shall take affirmative action to ensure that applicants are employed, and that applicants are treated during employment, without regard to that applicant's race, religion, color, sex, national origin, or age. Such action shall include, but not be limited to, employment, upgrading, demotion, transfer, recruitment, recruitment advertisement, layoff, termination, rates of pay or other forms of

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

compensation, and selection for training, including apprenticeship. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices setting forth the requirements of these non-discrimination provisions.

(Paragraph Deleted)

§ 13.6.2 The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin, or age.

§ 13.6.3 The Contractor shall include all of this Paragraph 13.8 in every Subcontract or Purchase Order, and shall require each Subcontractor and Material and Equipment Supplier to include this Paragraph 13.8 in each of their subcontracts and Purchase Orders, so that such provisions will be binding upon each Subcontractor, Sub-subcontractor, and Material and Equipment Supplier.

§ 13.6.4 In the event of the Contractor's noncompliance with any portion of this Paragraph 13.8, the Owner may cancel, terminate, or suspend this Contract.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 No Right To Stop Work for Non-Payment

The Contractor has no right to stop Work as a consequence of non-payment. In the event of any disagreement between the Contractor and Owner involving the Contractor's entitlement to payment, the Contractor's only remedy is to file a Claim in accordance with Article 15. The Contractor must diligently proceed with the Work pending resolution of the Claim. If, however, an Application for Payment has been approved for payment by the Owner, and the Owner fails to make payment within sixty (60) days of the approval for payment by the Owner, the Contractor may upon ten (10) days written notice to the Owner, stop work if payment is not made by the Owner within ten (10) days following the notice.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

.1 Fails to supply adequate properly skilled workers or proper materials;

.2 Fails to make payment to Subcontractors or Suppliers for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors or Suppliers;

.3 Fails to comply with any laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;

.4 Fails to perform the Work in accordance with the Contract Documents or otherwise breaches any provision of the Contract Documents;

.5 Anticipatorily breaches or repudiates the Contract;

.6 Fails to make satisfactory progress in the prosecution of the Work required by the Contract; or

.7 Endangers the performance of this Contract.

§ 14.2.2 The Owner may terminate the Contract, in whole or in part, whenever the Owner determines that sufficient grounds for termination exist as provided in Subsection 14.2.1. The Owner will provide the Contractor with a written notice to cure the default. If the default is not cured, the termination for default is effective on the date specified in the Owner's written notice. However, if the Owner determines that default contributes to the curtailment of an essential service or poses an immediate threat to life, health, or property, the Owner may terminate the Contract immediately upon issuing oral or written notice to the Contractor without any prior notice or opportunity to cure. In addition to any other remedies provided by law or the Contract, the Contractor must compensate the Owner for additional costs that foreseeably would be incurred by the Owner, whether the costs are actually incurred or not, to obtain substitute performance. A termination for default is a termination for convenience if the termination for default is later found to be without justification.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 14.2.3 Upon receipt of written notice from the Owner of termination, the Contractor must:

.1 cease operations as directed by the Owner in the notice and, if required by the Owner and County, participate in an inspection of the Work with the Owner, County and the Architect to record the extent of completion thereof, to identify the Work remaining to be completed or corrected, and to determine what temporary facilities, tools, equipment and construction machinery are to remain at the Site pending completion of the Work;

.2 complete or correct the items directed by the Owner, and take actions necessary, or that the Owner may direct, for the protection and preservation of any stored materials and equipment and completed Work;

.3 unless otherwise directed by the Owner, remove its tools, equipment and construction machinery from the Site, and

.4 except as directed by the Owner, terminate all existing subcontracts and purchase orders and enter into no further subcontracts or purchase orders.

§ 14.2.4 Following written notice from the Owner of termination, the Owner may:

.1 take possession of the Site and of all materials and equipment thereon, and at the Owner's option, such temporary facilities, tools, construction equipment and machinery thereon owned or rented by the Contractor that the Owner elects to utilize in completing the Work;

.2 accept assignment of subcontracts and purchase orders, and

.3 complete the Work by whatever reasonable method the Owner may deem expedient.

§ 14.2.5 Upon termination for cause, the Contractor must take those actions described in Section 14.2.3, and the Owner may take those actions described in Section 14.2.4, subject to the prior rights of the Contractor's Surety.

§ 14.2.6 When the Owner terminates the Contract for cause, the Contractor is not entitled to receive further payment until the Work is completed and the costs of completion have been established.

§ 14.2.7 If the unpaid balance of the Contract Sum less amounts which the Owner is entitled to offset from the unpaid Contract balance including actual or Liquidated Damages, exceeds the costs of completing the Work, including compensation for the Owner's and the Architect's services made necessary thereby, such excess will be paid to the Contractor or Surety, as directed by the Surety. If such costs exceed the unpaid Contract balance, the Contractor must pay the difference to the Owner upon written demand. This obligation for payment survives termination of the Contract.

§ 14.2.8 In completing the Work following termination for cause, the Owner is not required to solicit competitive bids or to award completion work to the lowest bidder, but may obtain such completion work and related services on the basis of sole source procurement and negotiated compensation.

§14.2.9 If the Contractor files for protection, or a petition is filed against it, under the Bankruptcy laws, and Contractor wishes to affirm the Contract, Contractor shall immediately file with the Bankruptcy Court a motion to affirm the Contract and shall provide satisfactory evidence to Owner and to the Court of its ability to cure all present defaults and its ability to timely and successfully complete the Work. If Contractor does not make such an immediate filing, Contractor accepts that Owner shall petition the Bankruptcy Court to lift the Automatic Stay and permit Owner to terminate the Contract.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1.No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract or any portion thereof or of the Work for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of termination, the Contractor must:

.1 Cease operations as directed by the Owner in the notice and, if required by the Owner, participate in an inspection of the Work with the Owner and the Architect/Engineer to record the extent of completion thereof, to identify the Work remaining to be completed or corrected, and to determine what temporary facilities, tools, equipment and construction machinery are to remain at the Site pending completion of the Work;

.2 Complete or correct the items directed by the Owner, and take actions necessary, or that the Owner may direct, for the protection and preservation of any stored materials and equipment and completed Work;

.3 Unless otherwise directed by the Owner, remove its tools, equipment and construction machinery from the Site, and

.4 Except as directed by the Owner, terminate all existing subcontracts and purchase orders related to the Work and enter into no further subcontracts or purchase orders therefor.

§ 14.4.3 Following written notice from the Owner of termination, the Owner may:

.1 Take possession of the Site and of all materials and equipment thereon, and at the Owner's option, such temporary facilities, tools, construction equipment and machinery thereon owned or rented by the Contractor that the Owner elects to utilize in completing the Work;

.2 Accept assignment of subcontracts and purchase orders; and

.3 Complete the Work by whatever reasonable method the Owner may deem expedient**.**

§ 14.4.4 In case of termination for the Owner's convenience, the Contractor will be entitled to compensation only for the following items:

.1 Payment for acceptable Work performed up to the date of termination;

.2 The costs of preservation and protection of the Work if requested to do so by the Owner;

.3 The cost of terminating the following contracts including:

(i.) Purchased materials but only if not returnable and provided to the Owner, or the restocking or return charge, if any, if returnable at the Owner's written election;

(ii.) Equipment rental contracts if not terminable at no cost but not to exceed an amount equal to thirty (30) days rental;

.4 Documented transportation costs associated with removing Contractor-owned equipment;

.5 Documented demobilization and close-out costs; and

.6 Overhead and profit on the foregoing not to exceed ten (10%) percent.

The Contractor will not be compensated for the cost of terminating subcontracts, which must be terminable at no cost to the Owner if the Contract is terminated. The Contractor will not be compensated for the cost of any idled employees unless the employee is under a written employment contract entitling the employee to continued employment after termination of the Contract and the employee cannot be assigned to other work provided that in all events the Contractor's costs must be limited to thirty (30) days of employment costs from the date of the notice of termination. The Contractor is not entitled to any other costs or compensation (including lost or expected profit, uncompensated overhead or related expenses, or the cost of preparing and documenting its compensable expenses under this Subsection 14.4.4 as a consequence of the Owner's termination of the Contract for convenience. The

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.

User Notes: (3B9ADA47)

Contractor conclusively and irrevocably waives its right to any other compensation or damages (compensatory or punitive) arising from termination of the Contract. If the Owner and the Contractor are unable to agree upon the amounts specified in this subsection, the Contractor may submit a Claim as provided in Article 15. The Claim must be limited to resolution of the amounts specified in Subsections 14.4.4.1, 14.4.4.2, 14.4.4.3 and 14.4.4.4 of this Subsection 14.4.4. No other cost, damages, or expenses may be claimed or paid to the Contractor or considered as part of the Claim, the same being hereby conclusively and irrevocably waived by the Contractor. Any such Claim must be delivered to the Owner within thirty (30) days of the termination of the Contract and must contain a written statement setting forth the specific reasons and supporting calculations and documentation as to the amounts the Contractor claims to be entitled to under this Subsection as a result of the termination of the Contract.

§ 14.4.5 The Contractor's obligations surviving final payment under the Contract, including without limitation those with respect to insurance, indemnification, and correction of Work that has been completed at the time of termination, remains effective notwithstanding termination for convenience of the Owner.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Notice of circumstances that could give rise to a Claim must be given to the other party as soon as possible, to enable that party to take action as appropriate to lessen the impact of the potential Claim. The party recognizing a potential claim shall also explore all options and generate suggestions for how to avoid or overcome the impact of the circumstances. If damage cannot be avoided, Claims by either the Owner or Contractor must be initiated by written notice by mail or electronically to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within ten (10) days after occurrence of the event giving rise to such Claim or within ten (10) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

(Paragraph Deleted)

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the critical path of construction.

(Paragraphs Deleted)

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to Dispute Resolution pursuant to
Section 6.2 of the executed AIA Document A101-2017, Standard Form of Agreement Between Owner and Contractor.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

(Paragraph Deleted)

§ 15.2.6 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.7 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 The parties shall endeavor to resolve by mediation any Claims, dispute, or other matter in question or arising out of or related to the Contract. The parties shall share the mediator's fee and any filing fees equally. The parties will bear their own attorneys' fees, expert witnesses' fees, costs and expenses in the mediation. The mediator shall be an attorney selected by the parties from the United States Arbitration and Mediation (USA&M), and the mediation shall be held at USA&M's offices in St. Louis, Missouri, at a time and date to be decided, unless another mediator or location mutually agreed upon. Mediation is not a condition precedent to commencing litigation, but if litigation is commenced before mediation is held, the Parties agree to mediate before any dispositive motions or trial.

§ 15.3.1 The parties do not resolve the disputes through meditation pursuant to Section 15.3.1, the method of binding dispute resolution shall be litigation in the Circuit Court for Franklin County, Missouri.

(Paragraphs Deleted)

ARTICLE16 REGULATIONS

§ 16.1 Contractor's Responsibilities

§ 16.1.1 The Contractor shall assume all responsibility and costs in complying with Federal, State and Local regulations for Equal Opportunity Employment, Anti-Discrimination, Safety and other Regulations.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 12:49:28 ET on 11/29/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA47)

INVITATION TO BID
UNION R-XI SCHOOL DISTRICT
BID #18-5
Union R-XI Middle School

Notice is hereby given that the Union School District will receive sealed bids clearly marked "Bid #18-5 MIDDLE SCHOOL" on or before **2:00 P.M. CDT, Tuesday March 12, 2019** to Union R-XI School District, Attn: Mike Mabe, 1 Wildcat Dr., Union, MO 63084. Please use the north entrance of the gymnasium. It can be reached off Independence Dr.

There will be a public opening of the bids immediately following at the Union High School – Board of Education Office, 1 Wildcat Dr., Union, MO 63084. Documents will be available February 12, 2019 at https://planroom.drexeltech.com.

There will be one (1) bid package associated with this bid. Please reference the detailed scope of work narrative provided in the bid documents. The work would include providing the necessary labor, materials and equipment to construct associated sitework, construction of the new elementary school, site work and various bid alternates as detailed in the plans and specifications provided with the bid documents.

Prospective general contractors and subcontractors are highly encouraged to attend the pre-bid meeting that will be held on February 26, 2019 at 10:00 am CDT at the Middle School – 503 West End Ave., Union, MO 63084. Everyone will meet in the parking lot across the street (West End Avenue) from the Middle School. A site walkthrough will immediately follow the meeting. In the event of adverse weather please call Cory Bextermueller @ 314-601-1805.

The School District reserves the right to reject any and all submittals, or to advertise for new submittals if deemed necessary.

ATTN: Mike Mabe
Union R-XI School District
1 Wildcat Dr.
Union, MO 63084

Proposal for:
Union R-XI – Middle School Classroom Addition
503 West End Ave
Union, MO 63084

This form shall be completed and submitted in its entirety no later than 24 hours following the receipt of the bids to the Owner. Bidder must submit supplemental bid information via email as follows:

Re: Supplemental Bid Information for Union R-XI School District
Attn: Mike Mabe, Asst. Superintendent mabem@unionrxi.org
CC: Cory Bextermueller, Navigate Building Solutions, LLC. cory@navigatebuildingsolutions.com

COST BREAKOUT for Bid Package 1 General Works

Bidder shall provide the breakout for the following divisions of work following breakout of costs that are **INCLUDED** in the Base Bid.

Division 1-14 and 31, 32, 33 Scopes of Work

_____ DOLLARS ($_____).

Division 21 Scope of Work (Fire Suppression)

_____ DOLLARS ($_____).

Division 22 Scope of Work (Plumbing)

_____ DOLLARS ($_____).

Division 23, 25 Scope of Work (HVAC, Temperature Controls, Testing & Balancing)

_____ DOLLARS ($_____).

Division 26 Scope of Work (Electrical)

_____ DOLLARS ($_____).

Division 27, 28 Scope of Work (Communications, Electronic Safety & Security, Audio/Visual)

_____ DOLLARS ($_____).

UNIT PRICES for Bid Package 1 General Works

Unit Price Description	Unit	$/Unit
Unit Price No. 1: Removal of unsuitable soils and import & compaction of suitable soils.	Per CY	
Unit Price No. 2: Lime treatment of on-site unsatisfactory soils with Code-L material tilled in to a depth and percentage as directed by Civil Engineer.	Per CY	
Unit Price No. 3: Removal and haul-off of rippable rock.	Per CY	
Unit Price No. 4: Removal and haul-off of non-rippable rock.	Per CY	
Unit Price No. 5: Removal and haul-off of trench rock.	Per CY	
Unit Price No. 6: Removal and disposal of existing buried concrete man-made structures.	Per CY	
Unit Price No. 7: Removal, haul-off, and disposal of unsuitable soils and placement of lean concrete for soil remediation.	Per CY	
Unit Price No. 8: Load and haul-off of surplus soils.	Per CY	
Unit Price No. 9: Soil import, placement and compaction.	Per CY	
Unit Price No. 10: 1” clean rock placement and compaction	Per CY	
Unit Price No. 11: 1” minus rock placement and compaction	Per CY	
Unit Price No. 12: 2” clean rock placement and compaction	Per CY	
Unit Price No. 13: 2” minus rock placement and compaction	Per CY	
Unit Price No. 14: Topsoil place and final grade	Per CY	
Unit Price No. 15: Removal & haul-off of unsuitable soils and import & compaction of 1” granular material per Geotechnical Engineer recommendations	Per CY	

LIST OF PROPOSED SUBCONTRACTORS for Bid Package 1 General Works

A list of the two apparent subcontractors in each division that are being considered for award to perform work on the jobsite including their union affiliation and their M/WBE status and amount.

If you do not plan to use subcontractors, indicate below and return this form with your bid.

Please list the two subcontractors in each category that the above referenced Bidder intends to negotiate subcontracts for materials, services, supplies, specialty contractors, etc. as follows:

Scope of Work	Proposed Subcontractors	Union/ Non-Union	Potential M/W/DBE Contract Amount
Site Demo/ Earthwork	1. 2.		
Site Utilities	1. 2.		
Asphalt	1. 2.		
Landscaping/ Irrigation	1. 2.		
Site Concrete	1. 2.		
Deep Foundations	1. 2.		
Concrete Footings	1. 2.		
Concrete Flatwork	1. 2.		
Precast Manufactuer & Installer	1. 2.		

Masonry	1. 2.		
Steel Fabricator & Installer	1. 2.		
Rough/Finish Carpentry	1. 2.		
Millwork/Casework	1. 2.		
Air Barrier	1. 2.		
Roofing	1. 2.		
Sheet Metal	1. 2.		
Doors, Frames, Hardware	1. 2.		
Storefront/Curtainwall	1. 2.		
Framing & Drywall	1. 2.		
Ceilings	1. 2.		
Flooring	1. 2.		

Painting	1. 2.		
Plumbing	1. 2.		
Fire Protection	1. 2.		
Mechanical	1. 2.		
Electrical/Low Voltage	1. 2.		
Audio/Visual	1. 2.		

Submitted By:

Bidder: _____

Address: _____

_____

Business Telephone: _____ Fax Number:_____

Typed/Printed Name:_____

Authorized Signature:_____

Title:_____

(Seal - if bid by a corporation)

Date:_____

END: SUPPLEMENTAL BID INFORMATION

LOGISTICS PLAN

UNION R-XI MIDDLE SCHOOL IMPROVEMENT PLANS SITE PLAN

MAN DOOR ON SOUTH SIDE OF BUILDING NEEDS TO BE ACCESIBLE OUTSIDE THE FENCED AREA.

BUSES USE THE TRACK DAILY. ACCESS NEEDS TO BE MAINTAINED DURING THE SCHOOL YEAR.

GREEN LINE IS TEMPORARY CONSTRUCTION FENCE.

CHILDREN USE THIS SIDEWALK DAILY FOR ARRIVAL AND DISSMAL. ACCESS NEEDS TO BE MAINTAINED DURING THE SCHOOL YEAR.

CONSTRUCTION GATE TO BE FAR ENOUGH OFF THE ROAD SO THAT A TRUCK WAITING TO ENTER THE SITE WILL NOT BLOCK CROSS TRAFFIC.

ALL CONSTRUCTION TRAFFIC HAS TO STAY OFF WEST END AVENUE DURING ARRIVAL AND DISSMAL HOURS POSTED IN THE SCOPE OF WORK DOCUMENT.

Job Trailer, Storage, Parking, Lay Down Area.

This field needs to be returned to its existing condition at the end of the project. Graded and weeded well enough for little league football practice.
CONTRACTOR CAN USE 1/2 THIS FIELD AND IT WILL NEED TO BE 100% FENCED IN.

EXISTING BUILDING
EXISTING SANITARY MANHOLE TOP EL.= 541.87 (TOP TO BE ADJUSTES TO FINISHED GRADE)
PROPOSED RELOCATED UTILITY POLE
EXISTING GAS METER
EXISTING GRAVEL DRIVE
PROPOSED RELOCATED AMEREN UTILITY POLE
PROPOSED GRAVEL PAD (SEE DETAIL, SHEET C5.6)
PROPOSED DUMPSTER PAD (SEE DETAIL, SHEET C5.6)
PROPOSED GATE (BY OTHERS)
EXISTING ASPHALT PAVEMENT
EXISTING UTILITY POLE w/ GUY WIRES
PROPOSED STANDARD DUTY ASPHALT PAVEMENT (SEE DETAIL, SHEET C5.5)
EXISTING LIGHT
PROPOSED 8"ø PVC DOWNSPOUT COLLECTOR
PROPOSED EXPANSION FINISHED FLOOR ELEV.= 540.40
PROPOSED RELOCATED FIRE HYDRANT LOCATION w/BOLLARDS (SEE DETAIL, SHEET C5.6)
T.B.M. EXISTING FINISH FLOOR ELEV. = 540.40
PROPOSED 6' WIDE CONCRETE SIDEWALK (SEE DETAIL, SHEET C5.6)
PROPOSED CONCRETE STEPS (SEE ARCHITECTURAL PLANS)
PROPOSED LIGHT
EXISTING DOWNSPOUT
EXISTING CLEANOUT
EXISTING RETAINING WALL
PROPOSED CONCRETE SIDEWALK (SEE DETAIL, SHEET C5.6)
PROPOSED SIGN
PROPOSED ADA ACCESSIBLE RAMP (SEE DETAIL A, SHEET C5.6)
PROPOSED ADA ACCESSIBLE RAMP (SEE DETAIL B, SHEET C5.6)
EXISTING FIRE HYDRANT
EXISTING STORM BASIN TOP ELEV. 551.06 INV. ELEV.= 548.48
EXISTING STORM BASIN TOP ELEV. 550.98 INV. ELEV.= 545.41
EXISTING WATER VALVE
EXISTING "NO PARKING" SIGN
EXISTING SANITARY MANHOLE TOP ELEV.= 552.34 INV. ELEV.= 541.96
WEST END AVENUE

N

0 20 40 60
SCALE 1" = 20'

OWNER/DEVELOPER: UNION SCHOOL DISTRICT
P.O. BOX 440
UNION, MO 63090

ENGINEER/SURVEYOR: WUNDERLICH SURVEYING & ENGINEERING, INC
512 EAST MAIN STREET
UNION, MISSOURI 63084

GENERAL NOTES

SITE ADDRESS: 503 WEST END AVE.
BOOK: C, PAGE 28
ZONING: R-2
LOT AREA: 9.8 ACRES PER COUNTY RECORDER
FRONT SETBACK: 25'
SIDE SETBACK: 15'
REAR SETBACK: 25'
MINIMUM LOT AREA: 10,000 SQ. FT.

THIS SITE IS IN ZONE "X" UNSHADED PER FLOOD INSURANCE RATE MAP PANEL 29071C0285D, EFFECTIVE DATE OF 10/18/2011 AS DETERMINED BY SCALING

UTILITIES:
ELECTRIC: AMEREN MISSOURI ELECTRIC
CABLE: CHARTER COMMUNICATIONS
SEWER: BRUSH CREEK SEWER DISTRICT
TELEPHONE: AT&T
WATER: PUBLIC WATER SUPPLY DISTRICT #3

UTILITY LOCATE: 1-800-DIG-RITE (344-7483)
MO ONE CALL TICKET NO. 141641887

CONSTRUCTION NOTES:

1.) UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THEREFORE, THE RELATIONSHIP BETWEEN PROPOSED WORK AND EXISTING FACILITIES, STRUCTURES, AND UTILITIES MUST BE CONSIDERED APPROXIMATE AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THEIR EXACT LOCATION AND THE EXISTENCE OF ANY UTILITY NOT SHOWN. (ALL UTILITIES SHALL BE LOCATED BOTH HORIZONTALLY AND VERTICALLY TO INSURE CLEARANCE/COVER OF ANY PROPOSED GRADING, SEWER, FOOTINGS, ETC. PRIOR TO CONSTRUCTION. UTILITY COMPANY REPRESENTATIVES SHALL BE ON SITE DURING SUCH TIMES THAT EXCAVATION IS TAKING PLACE IN THE VICINITY OF THEIR FACILITIES.) NO SUB-SURFACE EXPLORATION WAS UNDERTAKEN ON THIS SITE. ALL UNDERGROUND UTILITIES ARE CONSIDERED APPROXIMATE AND ARE NOT CERTIFIED HERETO.
2.) ALL ELEVATIONS ARE BASED ON MODOT VRS NETWORK NAVD 1988.
3.) BOUNDARY INFORMATION FROM SUBHOLT'S ADDITION TO THE CITY UNION SUBDIVISION PLAT.
4.) CONTOURS BASED ON TOPOGRAPHIC INFORMATION COLLECTED BY WSE IN JUNE 2018.
5.) ALL EXCAVATIONS, WHETHER THEY BE UTILITY TRENCHES, BASEMENT EXCAVATIONS, OR FOOTING EXCAVATIONS, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CONSTRUCTION STANDARDS FOR EXCAVATIONS.
6.) PRIOR TO BEGINNING ANY WORK ON THE SITE, THE CONTRACTOR SHALL CONTACT THE OFFICE OF THE DEVELOPER FOR SPECIFIC INSTRUCTIONS RELEVANT TO THE SEQUENCING OF WORK.
7.) ALL WORK MUST BE PERFORMED WITHIN EXISTING OR ACQUIRED EASEMENTS, AGENCY APPROVAL OF THESE PLANS DOES NOT AUTHORIZE OR CONDONE WORK OUTSIDE OF THE EASEMENTS.
8.) ALL CONSTRUCTION METHODS AND MATERIAL SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF UNION, MISSOURI. IN THE ABSENCE OF ANY APPLICABLE LOCAL STANDARDS, THE REQUIREMENTS SET FORTH HEREON SHALL GOVERN.
9.) SILTATION AND EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO ANY GRADING OPERATIONS AND SHALL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS UNTIL SUFFICIENT VEGETATION HAS BEEN ESTABLISHED ON THE SITE TO PREVENT EROSION.
10.) ADDITIONAL SILTATION CONTROL MAY BE REQUIRED AS DIRECTED BY LOCAL GOVERNING AUTHORITY OR THE STATE OF MISSOURI.
11.) SLOPES ON THIS PROJECT SHALL NOT BE GREATER THAN THREE UNITS HORIZONTAL TO ONE UNIT VERTICAL(3:1). IF CUT AND FILL OPERATIONS OCCUR DURING A SEASON NOT FAVORABLE FOR IMMEDIATE ESTABLISHMENT OF A PERMANENT GROUND COVER, A FAST GERMINATION ANNUAL SUCH AS RYE GRASSES SHALL BE UTILIZED TO PREVENT EROSION.
12.) THE CONTRACTOR SHALL KEEP EXISTING ROADWAY AND SIDEWALKS CLEAN OF MUD AND DEBRIS.
13.) CONTRACTOR TO PROVIDE ADEQUATE ON-SITE PARKING FOR CONSTRUCTION EMPLOYEES.
14.) SCHEDULE "B" OF A CURRENT TITLE REPORT HAS NOT BEEN FURNISHED TO THE LAND SURVEYOR BY THE CLIENT AND NO INVESTIGATION HAS BEEN CONDUCTED AS TO THE PRESENT STATUS OF EASEMENTS OR OTHER RESTRICTIVE CONDITIONS AFFECTING THE SUBJECT LAND.
15.) NO GEOTECHNICAL EVALUATION HAS BEEN COMPLETED BY THIS OFFICE FOR THE SITE. THIS PLAN DOES NOT CERTIFY THAT THE EXISTING SOIL ON SITE IS SUITABLE FOR CONSTRUCTION. THIS OFFICE RECOMMENDS A GEOTECHNICAL ENGINEER BE CONSULTED TO DETERMINE THE SUITABILITY OF THE EXISTING SUBGRADE AND EXISTING ON-SITE MATERIAL PRIOR TO BEGINNING ANY FILLING OPERATIONS.
16.) ALL SITE GRADING AND EARTHWORK CONSTRUCTION SHALL COMPLY TO THE GEOTECHNICAL REPORT RECOMMENDATIONS.
17.) CONTRACTOR MUST RECEIVE ALL REQUIRED PERMITS FROM THE LOCAL GOVERNING OFFICIALS AND THE STATE OF MISSOURI PRIOR TO ANY EXCAVATION.
18.) NO PARKING ALLOWED OUTSIDE OF DESIGNATED PARKING AREAS.
19.) CONTRACTOR TO COORDINATE THE ELECTRICAL CONNECTION TO THE NEW BUILDING WITH THE OWNER.
20.) ALL WATER MAIN SHALL BE DR14 CLASS 900 PVC (OR CLASS 900 WITH A 200 PSI WORKING PRESSURE) TO MEET AWWA C900 STANDARDS.
21.) ALL ELECTRICAL, SANITARY SEWER, AND WATER SERVICE CONNECTIONS TO THE BUILDING SHALL BE COORDINATED WITH THE MEP DRAWINGS AND THE CITY OF UNION.

LEGEND

= FOUND MONUMENT
= SET 1/2" IRON ROD UNLESS NOTED
(R) = RECORDED DISTANCE PER SUBD. PLAT
(M) = MEASURED DISTANCE
(D) = DEEDED DISTANCE
ESS = EXISTING SANITARY SEWER LINE
SS = PROPOSED SANITARY SEWER LINE
OHE = OVERHEAD ELECTRIC
UGE = UNDERGROUND ELECTRIC
GAS = GAS LINE
TEL = EXISTING TELECOMMUNICATIONS LINE
EW = EXISTING WATER LINE
W = PROPOSED WATER LINE(DR14 CLASS 900)
X = STORM SEWER
FM = FENCE LINE
P = FORCE MAIN
= PIPE LINE
= TREE(ALL TREES MAY NOT BE SHOWN)
= TREE LINE
= BRUSH/SHRUB LINE
= GUARD RAIL
= CLEAN OUT
= GUY ANCHOR
= TELEPHONE BOX
T.B.M. = TEMPORARY BENCHMARK
= SIGN
= UTILITY POLE(U.P.)
= WATER VALVE
= LIGHT POLE
= GAS VALVE
= WATER METER
= FIRE HYDRANT
= GRATED INLET/YARD DRAIN
= SINGLE CURB INLET(CI)
= DOUBLE CURB INLET(DCI)
= AREA INLET(AI)
= STORMWATER JUNCTION BOX(JB)
= STORMWATER DRAINAGE DIRECTION
= HANDICAPPED PARKING SPACE
594.0 = FINISHED GRADE SPOT ELEVATION
BOC = TOP BACK OF CURB
FL = FLOW LINE
= TRAFFIC FLOW DIRECTION
= WATER LATERAL
= SANITARY LATERAL
= EXISTING SANITARY MANHOLE(MH)
= PROPOSED SANITARY MANHOLE(MH)
= STREET LIGHT
= EXISTING ASPHALT PAVEMENT
= PROPOSED ASPHALT PAVEMENT
= EXISTING CONCRETE
= PROPOSED CONCRETE

WUNDERLICH
SURVEYING & ENGINEERING INC.
512 EAST MAIN STREET
UNION, MO 63084 (636) 583-8400
WSETEAM.COM

WUNDERLICH SURVEYING & ENGINEERING, INC.
MISSOURI STATE CERTIFICATE OF AUTHORITY:
ENGINEERING: 001586
LAND SURVEYING: 002253

UNION R-XI MIDDLE SCHOOL IMPROVEMENT PLANS
SITE PLAN

A TRACT OF LAND BEING PART OF SECTION 27, T43N, R1W OF THE 5TH P.M. IN THE CITY OF UNION, FRANKLIN COUNTY, MISSOURI

KRISTOPHER H. WOLFE
NUMBER PE-2008019619
PROFESSIONAL ENGINEER
1-30-2019

Kristopher H. Wolfe, P.E.-2008019619
P.E. for Wunderlich Surveying & Engineering Inc.

THIS SEAL IS FOR DESIGN ONLY AND NOT CONSTRUCTION INSPECTION OR STAKING OUT OF IMPROVEMENTS

SCALE: 1"=20'
JOB: 7022
DATE: 01/2019
DWN: BY: RKS
SC: RR

BID SET

SHEET
C3.2
MIDDLE SCHOOL

GEOTECHNICAL REPORT

Middle School Classroom Addition
503 West End Avenue
Union, Missouri

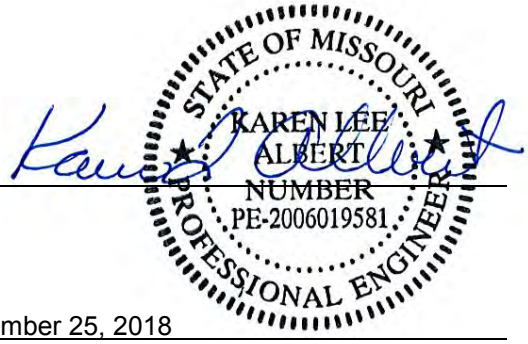
Project No. 18-7368G

September 2018

Presented to:

Union R-XI School District

Union, Missouri



September 25, 2018
Date

Karen L. Albert, P.E. #2006019581
State of Missouri
Registered Professional Engineer for Cochran

COCHRAN

Architecture • Civil Engineering • Land Surveying • Site Development • Geotechnical Engineering • Inspection & Materials Testing

8 East Main Street	737 Rudder Road	**530A East Independence Drive**	534 Maple Valley Drive	767 North 20th Street	905 Executive Drive
Wentzville, MO 63385	Fenton, MO 63026	**Union, MO 63084**	Farmington, MO 63640	Ozark, MO 65721	Osage Beach, MO 65065
Phone: 636-332-4574	Phone: 314-842-4033	**Phone: 636-584-0540**	Phone: 573-315-4810	Phone: 417-595-4108	Phone: 573-525-0299
Fax: 636-327-0760	Fax: 314-842-5957	**Fax: 636-584-0512**	Fax: 573-315-4811	Fax: 417-595-4109	Fax: 573-525-0298

www.cochraneng.com

September 25, 2018

Dr. Virgil Weideman
Board President
Union R-XI School District
770 Independence Drive
Union, MO 63084

RE: Geotechnical Investigation
Middle School Classroom Addition
503 West End Avenue
Union, Missouri
Project No. 18-7368G

Dear Dr. Weideman:

Attached is our Geotechnical Report presenting the results of a subsurface exploration conducted for the above-referenced project. This exploration was conducted in general accordance with our proposal. The Geotechnical Report includes our understanding of the project, observed site conditions, conclusions and/or recommendations, and support data as listed in the Table of Contents.

We appreciate the opportunity to be of service to you on this project. We welcome the opportunity to provide other services during the course of the project, should they be necessary. If you have any questions or comments, please feel free to contact us.

Sincerely,

Karen L. Albert, P.E.
Director of Geotechnical Services
Cochran

Copies submitted: 3 Bound Reports, 1 Electronic

TABLE OF CONTENTS

ITEM **PAGE**

1. EXECUTIVE SUMMARY 1

2. INTRODUCTION 1

3. PROJECT AND SITE DESCRIPTION 1

4. FIELD EXPLORATION AND LABORATORY TESTING 2
A. Field Exploration 2
B. Laboratory Testing 2

5. SUBSURFACE CONDITIONS 2
A. Stratigraphy 2
B. Groundwater 2

6. GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS 2
A. Site Preparation 3
B. Expansive Clay Soil 3
C. Engineered Fill Materials 4
D. Compaction 4
E. Siltation Control 4
F. Weather Related Conditions 4
G. Site Drainage and Grading 4
H. Construction Dewatering 5

7. FOUNDATIONS 5

8. FLOOR SLABS 5

9. LATERAL EARTH PRESSURES 6

10. CHEMICAL ANALYSIS 6

11. SEISMICITY 7

12. SLOPES 7

13. TEMPORARY EXCAVATIONS 7

14. PAVEMENT SECTION CONSIDERATIONS 7

15. RECOMMENDED CONSTRUCTION SERVICES 8

16. LIMITATIONS OF REPORT 9

ILLUSTRATIONS **Plate**

Vicinity and Topography Map 1
Site and Boring Locations 2

APPENDIX A

Detailed Logs of Borings MS-1 through MS-7
Boring Logs: Legend and Nomenclature

APPENDIX B

Laboratory Results

1. EXECUTIVE SUMMARY

The following is a brief summary of the exploration including our findings, conclusions, and recommendations. The summary omits a number of details, any one of which could be crucial to the proper application of this report. Any party who relies on this report must refer to subsequent sections within the report for a more detailed discussion.

A. The project consists of an approximately 13,700 square foot, slab-on-grade classroom addition to be constructed on the west side of the Union Middle School located at 503 West End Avenue in Union, Missouri. The finished floor elevation for the addition will be EL 540.4. Based on the anticipated finished floor elevation of EL 540.4, fills up to 3 feet and cuts up to 5 feet are anticipated within the proposed building footprint. Retaining walls are not planned at the site.

B. The soil stratigraphy at the site generally consists of medium stiff to very stiff, high plastic clay to depths of 9 to 20 feet below the existing ground surface. Below the clay, highly weathered limestone was encountered to auger refusal. Auger refusal was encountered in the seven borings to depths of 11 to 22.5 feet below the existing ground surface. Auger refusal may represent either a hard soil layer or bedrock. Since rock coring was not performed in the four borings, the character of the refusal materials could not be determined. Fill consisting of low plastic silty clay and high plastic clay was encountered in Borings MS-1 through MS-4 and MS-6 to depths of 3.5 to 5.5 feet.

C. Strip and spread footings may be proportioned for a net allowable bearing pressure of 2,000 pounds per square foot, provided they bear on firm natural soil or compacted engineered fill.

D. Expansive soil is present at the site that will affect the proposed construction. Over excavation and replacement of the high plastic soils is recommended to reduce the risk of floor slab distress.

E. Undocumented fill is present in Borings MS-1 through MS-4 and MS-6 to depths of 3.5 feet to 5.5 feet. The fill is considered to be compressible and should be removed and backfilled with compacted engineered fill.

F. The excavation should extend to a 5 foot horizontal distance beyond the proposed building footprint.

G. Care must be exercised to maintain the integrity of the subgrade during grading, as the soils are susceptible to disturbance.

H. The project classifies as a Site Class C in accordance with Section 1613 of the International Building Code (IBC).

I. Cochran should be retained to conduct construction observation and material testing. Close monitoring of subgrade preparation work is considered critical to achieve adequate foundation and subgrade performance.

2. INTRODUCTION

Cochran has completed the requested geotechnical service for the proposed classroom addition to the west side of the Middle School located at 503 West End Avenue in Union, Missouri. The services documented in this report were provided in general accordance with the terms, conditions and scope of services described in Cochran's proposal. This report was prepared for the purpose of describing the subsurface conditions at the site, analyze and evaluate the test data, and develop recommendations for geotechnical aspects of the design and construction of the project. Our services consisted of site reconnaissance, drilling seven (7) borings, laboratory testing, engineering analyses, report preparation and submittal of this report.

3. PROJECT AND SITE DESCRIPTION

The project consists of an approximately 13,700 square foot, slab-on-grade classroom addition to be constructed on the west side of the Union Middle School located at 503 West End Avenue in Union, Missouri. The finished floor elevation for the addition will be EL 540.4.

Currently the site is asphalt and/or grass covered.

Based on a grading plan conducted by Wunderlich Surveying and Engineering dated August 2018, the elevation at the site within the footprint of the proposed building ranges from EL 538 to 545. Based on the anticipated

finished floor elevation of EL 540.4, fills up to 3 feet and cuts up to 5 feet are anticipated within the proposed building footprint. Retaining walls are not planned at the site. The site location is shown on the United States Geological Survey (USGS) map included as Plate 1.

4. FIELD EXPLORATION AND LABORATORY TESTING

A. Field Exploration. The subsurface conditions at the site were explored by drilling a total of seven borings designated as MS-1 through MS-7. The boring locations were measured from existing site features. The elevations were interpolated from the most recent topographic survey. The locations and elevations should be considered accurate only to the degree implied by the methods employed. The boring locations are presented on Plate 2.

Borings MS-1 through MS-7 encountered auger refusal at depths of 11 to 22.5 feet. Standard Penetration Tests (SPTs) were generally obtained at 2.5-foot to 5-foot intervals in the overburden soils using an automatic hammer. Undisturbed Shelby tube samples were collected at select locations. The samples were sealed, secured, and transported to our laboratory for observation and testing. The sampling intervals, soil descriptions, standard penetration data and other pertinent field information are indicated on the boring logs, which are presented in Appendix A. An explanation of the terms and symbols used on the boring logs is also provided in Appendix A.

B. Laboratory Testing. In the laboratory, the samples were observed and described by an engineer using manual-visual methods. Moisture contents were determined for cohesive soil samples. Atterberg limits were determined for select soil samples. Dry density and unconfined compression tests were determined for select undisturbed samples. The soil resistivity and pH was determined for a select soil sample. The results of the laboratory tests are presented on the boring logs in Appendix A. The soil resistivity and pH test results are presented in Appendix B.

5. SUBSURFACE CONDITIONS

A. Stratigraphy. The general description of the soils encountered during the subsurface exploration is presented herein. The stratification lines on the boring logs are approximate and the transition between the materials may be gradual rather than distinct.

The soil stratigraphy at the site generally consists of medium stiff to very stiff, high plastic clay to depths of 9 to 20 feet below the existing ground surface. Moisture contents in the clays ranged from 10 to 29 percent. Liquid limits ranged from 24 to 46 percent and plastic index ranged from 4 to 21. Below the clay, high weathered limestone was encountered to auger refusal. Auger refusal was encountered in the seven borings to depths of 11 to 22.5 feet below the existing ground surface. Auger refusal may represent either a hard soil layer or bedrock. Since rock coring was not performed in the four borings, the character of the refusal materials could not be determined.

Fill consisting of low plastic silty clay and high plastic clay was encountered in Borings MS-1 through MS-4 and MS-6 to depths of 3.5 to 5.5 feet.

B. Groundwater. Groundwater was encountered in Borings MS-1 though MS-3, MS-6 and MS-7 at depths of 5 to 13 feet below the existing ground surface during the subsurface exploration program. It should be understood that the observed or lack of observed groundwater levels on the boring logs may indicate groundwater may not have stabilized prior to backfilling. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be different than the levels indicated on the boring logs or lack of observed groundwater levels. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

6. GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS

Two geotechnical conditions on this site include the presence of expansive soil and sensitive soils. Our recommendations are presented with the understanding that the finished floor elevations will not be revised and maximum column loads are 100 kips.

Undocumented Fill. Undocumented fill is present in Borings MS-1 through MS-4 and MS-6 to depths of 3.5 to 5.5 feet. The fill is generally soft to stiff. The fill is considered to be compressible and should be removed and backfilled with compacted engineered fill. The excavation should extend to a 5 foot horizontal distance beyond the proposed building footprint.

Expansive Soils. High plastic soils were encountered in the seven borings that may affect the proposed construction. The expansive clay soils have the potential for volume change with corresponding changes in the soil moisture content. The volume change can lead to movement and cracking of floor slabs and in severe cases, movement and cracking of foundations and walls. Therefore, remediation of the expansive clay soils is recommended.

Sensitive Soils. Moisture contents of the natural soils on site range from 10 to 29 percent. **Therefore, the soils at the site are susceptible to disturbance during grading operations (i.e, pumping and/or rutting).** Care must be exercised to maintain the integrity of the subgrade when preparing the site for the placement of fill, making excavations, and other earth-related construction activities. The weak, spongy, and/or wet soils may be present in some areas, and it may be not be possible to perform conventional filling and compacting operations without disturbing the underlying soils. Care should be exercised to maintain the integrity of the subgrade prior to the placement of fill and building construction.

Managing sensitive surface soils will be dependent on the severity of the circumstances, the soil types, the season in which construction is performed and prevailing weather conditions. Some general guidelines for addressing potential soft and/or wet surface soils are:

- Optimize surface water drainage at the site during construction.
- Whenever possible, wait for dry weather conditions and do not operate construction equipment on the site during wet conditions. Rutting the surface soils will aggravate the condition and accelerate subgrade disturbance.
- Disk or scarify wet surface soils during periods of favorable weather to accelerate drying.
- Temporarily compact loose subgrade soils if rain is forecast to promote site drainage and minimize moisture infiltration.
- Use construction equipment that is well-suited for the intended job under the existing site conditions. Heavy rubber-tired equipment typically requires better site conditions than light, track-mounted equipment.

A. Site Preparation. All vegetation/organic materials and pavement must be stripped where encountered. The organic material can be stockpiled on-site for later use in landscaped areas or disposed of off-site in a legal manner. In all areas, the resulting exposed subgrade should be proofrolled, and any soft soil or yielding areas should be over excavated and backfilled with new compacted fill or well-graded crushed rock.

All existing underground components (e.g., utilities, etc), if present below the proposed building, must be completely removed and the resulting excavations backfilled with compacted fill.

Existing, urban fill materials, where encountered, should be entirely removed from within and to a 5 foot horizontal distance beyond the proposed building addition footprint. In planned pavement areas, urban fill, if encountered, should be removed to a depth of 2 feet below the subgrade elevation. In all areas, the resulting exposed subgrade should be proofrolled, and any soft soil or yielding areas should be over excavated and backfilled with new compacted engineered soil fill or well-graded crushed limestone. Unsuitable areas disclosed by proofrolling must be remediated by removal and replacement, scarifying and recompaction, or other methods acceptable to the Geotechnical Engineer.

B. Expansive Soil. Expansive (high plastic) soil may be encountered at depths that will impact the proposed construction. High plastic soil should be removed and replaced with non-expansive engineered fill at a minimum depth of 3 feet below the floor slab and 2 feet below the foundation subgrades. The overexcavation should extend at least 2 feet beyond the outside edge of the footings and at least 5 feet laterally beyond the building footprint. The overexcavation may be backfilled with low plasticity soil (liquid limit less than 45 percent and plastic index of 20 or less) or 1-inch minus gradation crushed limestone. As an alternative, the footing overexcavation may be backfilled with lean concrete. With this option, widening of

the footing excavation is not required. The foundations and floor slabs would then be constructed on the newly placed fill.

The suggested methods of treatment described above are based on generally accepted standards in the local engineering community. Clay properties, such as plasticity, moisture content, density, swell pressure, and mineralogy are extremely variable. Therefore, swell pressures and volume change potential greater than can be mitigated by the suggested methods may exist. Consequently, when building in an area where high plasticity clay is present, the builder and owner should recognize that there is an inherent risk that floor slab and foundation damage may occur, even with remedial treatment of subgrade soil.

Although not required, it is advised remediating highly plastic soil in sidewalk and pavement subgrade areas to a depth of 12 inches below proposed subgrade elevation, if encountered.

C. Engineered Fill Materials. Prior to placement of the fill, the engineered fill material is to be approved by a representative of Cochran. In general, fill materials consist of low plasticity (liquid limit less than 45 percent and /or plastic index equal to or less than 20 percent) cohesive soils, lime treated soil or well graded limestone. The fill material should be free of organic and deleterious material. Expansive soils should not be placed as fill within 3 feet of floor slab subgrades or 2 feet below foundations. In general, clean rock should not be used, as they tend to hold water, resulting in softening of the underlying cohesive soil subgrade or if potentially expansive soils are present, may lead to slab or pavement heaving.

The existing low plastic soil can be processed and reused if deleterious and compressible materials such as wood can be removed if present. Unsuitable materials should be discarded**. In addition, if construction occurs in late fall to early spring, drying the onsite cohesive soils may not be possible and the contractor should budget for off site fill.**

D. Compaction. Engineered fill or backfill must be placed in lifts of uniform thickness and compacted. The fill should be placed in 8-inch loose lifts. The engineered fill should be compacted to at least 95 percent of its standard Proctor (ASTM 698) maximum dry density. Soil fill should be placed at a moisture content that is plus or minus 2 percent of optimum moisture content. The soil fill may require aeration or wetting at the time of construction to achieve proper compaction. Deleterious material should not be included in fill, nor should the fill be placed on soft or frozen materials. In addition to the minimum density requirements, the soil must be stable, i.e., not “pumping” or rutting excessively under construction traffic, prior to placing additional fill.

Settlement of loosely backfilled utility trenches can result in unsightly depressions and localized pavement failures. The magnitude of settlement can be significantly reduced by mechanically compacting the trench backfill to the minimum specified compaction levels given in the Compaction Section.

Observation of the type of soil or granular material to be placed as fill, placement of the compacted fill and field density testing should be performed by a qualified technician on each lift to verify the compaction requirements are met in the field and to insure that high plastic or highly compressible soils are not in the fill within the building pad area.

E. Siltation Control. The soils at this site may be susceptible to erosion and the potential for off–site siltation exists. Appropriate erosion control measures, such as proper site contouring during construction and siltation fences must be used during construction. Maintenance may be required during construction in the form of removing accumulated silt and restoring siltation control devices.

F. Weather Related Conditions. During wet weather periods, increases in the moisture content of the fine grained soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. **It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.**

G. Site Drainage and Grading. During construction, proper drainage should be provided to protect the foundation excavations, floor slab and pavement subgrades from the detrimental effects of weather conditions during construction. Finished subgrades and foundation excavations should be kept free of standing water at all times.

Positive site drainage should be provided to reduce surface water infiltration around the perimeter of the building and beneath the floor slab. Grades must be sloped away from the structures and roof and surface

drainage collected and discharged in such a way that water is not permitted to infiltrate the foundation backfill. Drain and utility pipes beneath the floor should have tight joints to prevent leakage. Utility trenches beneath the floor slab and pavement areas should be carefully backfilled with compacted low plastic soil or minus gradation crushed rock. "Clean" rock backfill should not be used because it can be a possible pathway for moisture to reach the potentially expansive high plastic clay.

Large trees and shrubs should not be planted next to exterior footings as they may cause drying and shrinkage of the foundation soils and, with the passage of time, potentially detrimental settlement of the building floor slab and foundation may occur. A minimum distance of 20 feet or a distance equal to 1.5 times their expected mature height is suggested.

H. Construction Dewatering. Short–term ground water readings made during the field exploration program indicated groundwater was present at depths of 5 (EL 533) to 13 feet (EL 527) below the existing ground surface during drilling and upon their completion, therefore, construction dewatering is not anticipated. If ground water seepage is experienced in shallow excavations, it is expected that it can be handled by pumping from sumps, or using perimeter trenches to collect and discharge the water away from the work area.

7. FOUNDATIONS

Shallow foundations bearing on low plastic firm natural soil or engineered fill are appropriate for support of the proposed building. Strip and spread footings may be proportioned for a net allowable bearing pressure of 2,000 pounds per square foot (psf), provided they bear on firm natural soil or compacted engineered fill.

The minimum lateral dimensions for strip and spread footings should be 24 and 30 inches, respectively. Exterior footings should be embedded 30 inches below the lowest adjacent exterior grade for frost protection purposes.

Due to the periodic severity of winters in this area, footings in poorly heated or unheated areas of the building should also be placed at least 30 inches below the adjacent exterior grade. All footings must be protected from the effects of frost when construction is carried out during winter months.

Special attention must be given to designing the foundations immediately adjacent to the existing structure. Foundations for the proposed additions should bear at the same elevation as those of the existing structure. Construction joints should be provided between the existing structure and the proposed addition to accommodate differential movement. During construction, the existing footings must not be undermined. It is the contractor's responsibility to protect the integrity of the existing footings.

For shallow foundations, proportioned and constructed as recommended above, total settlement should be less than 1 inch. Differential settlement between any two adjacent footings should be less than 1/2-inch.

The bearing conditions at the base of the footing excavation should be observed by Cochran personnel. The base of all foundation excavations should be free of water and loose soil prior to placing concrete.

8. FLOOR SLABS

It is recommended and preferred that the building floor slab be "floating," that is, not structurally connected to columns and foundation walls. This will permit modest horizontal and vertical movements to occur while minimizing cracking in these elements. Tying the slab to the foundation wall carries more risk of slab cracking due to the structural connection of the lightly loaded slab to the much more heavily loaded wall foundation.

If the design requires a tied slab, the construction sequence is important. It is recommended that the foundation wall, roof, and any significant dead loads that will be applied to the footings be in place prior to tying the slab. If not, the addition of load following the connection of the slab to the foundation wall may crack the slab even though foundation settlements are within predicted limits.

The floor slabs should be underlain by a minimum 4 inch layer of well-graded crushed rock to distribute concentrated loads and reduce potential capillary moisture transfer. The use of a plastic vapor barrier is left to the discretion of the architect. Careful attention to curing of the concrete slabs should be followed if a polyethylene moisture barrier is placed on top of the crushed stone and beneath the floor or excessive shrinkage cracking and "curling" may occur.

The floor slab should be supported by compacted engineered fill over mostly low plastic cohesive soil, topped with a 4 inch thick granular base course. Based upon this, it is our recommendation that a subgrade reaction modulus not to exceed 150 pounds per cubic inch (pci) be used for the design of the concrete floor slab.

9. LATERAL EARTH PRESSURES

Three earth pressure conditions are generally considered: at–rest, active, and passive. Retaining walls that are restrained at the top, such as truck–dock and tied foundation walls, should be designed for the at–rest condition. Walls which are free to rotate at the top at least ½ percent of the wall height may be designed using the active earth pressure condition. Resistance to the lateral loads may be provided using a combination of passive earth pressure and friction.

Total density, friction angle, active, active equivalent fluid density, at–rest, passive, and friction values are tabulated as follows:

Material	γ_t, *pcf*	Ø, °	K_a	EFD_a	K_o	K^1_p	*tan Ø*
Silty Clay (CL)	120	26	0.39	47	0.51	1.28	0.49
Fine aggregate	125	30	0.33	42	0.50	1.50	0.58
TYPE 5** stone[2]	130	38	0.24	30	0.38	2.10	0.78

[1] ½ of full passive

[2] MoDOT gradation

The passive resistance recommended above is one–half of the available passive resistance, as we do not recommend the use of full passive resistance in the design. This is due to the fact that the strains needed to mobilize the full passive earth pressure state are too large. That is, the horizontal movement needed to mobilize this resistance would result in unacceptable foundation translations. The use of 'one–half passive' is recommended as this state only requires about one–fourth the strain for the full passive state, and can be used in combination with the sliding resistances above.

It is further recommended that the passive resistance against the wall above the footing be ignored due to possible future changes in the soil conditions in this zone (e.g., frost action, excavation, utility installation, etc.). However, a passive resistance may be assumed against the face of the footing for design of the foundation wall. The foundation wall footing should bear at least 24 inches below grade to protect against frost action. Tension between the concrete and soil cannot be used in the design.

The backfill for the walls should consist of low plastic cohesive soil (PI ≤ 20 or LL ≤ 45) or granular material, compacted to 95 percent of standard Proctor. High plastic clay must not be used for wall backfill.

10. CHEMICAL ANALYSIS

Resistivity (AASHTO T288) and pH (AASHTO T289 tests were performed on a select soil sample. The test results indicated the following:

Boring	*Depth, ft.*	*Resistivity, ohm–cm*	*pH*
MS-1	3-5	11000	7.4

According to the American Iron and Steel Institute, the resistivity results for Boring MS-1 fall within Soil Class 2 and generally indicate 'good' resistance to corrosion. Based on these results, concrete, PVC, polyethylene, corrugated steel, cast iron, ductile iron, and copper pipe materials can be used for this project.

Portland cement concretes are generally resistant to chemicals whose pH is higher than 6. A primary requisite for chemical resistance of concrete is that it be made with the proper cement, cement–pozzolan combination, or cement–slag combination. Type I or II cement is acceptable. However, The

American Concrete Institute (ACI) recommends a dense concrete mix placed with a water/cement ratio not exceeding 0.4, thorough compaction, and proper curing

11. SEISMICITY

The International Building Code (IBC) requires the structural design of the proposed building to be in accordance with the appropriate seismic intensity zoning requirement. According to the International Building Code (IBC), soils within the upper 100 feet determine the seismic site classification criteria for the project site. Based on the soils encountered in the test borings and our experience with the location geology, the soil profile at the project site may be defined as Class C. The Spectral Acceleration for a Short Period (S_{DS}) value is 0.399g. The Spectral Acceleration for a 1-second Period (S_{D1}) value is 0.199g. The S_{DS} and S_{D1} values were obtained using online seismic design maps and tools provided by USGS (http://earthquark.usgu.gov/hazards/designmaps/).

12. SLOPES

Slope stability analysis of the existing and/or proposed slopes is beyond the scope of services. Stability of a slope depends on many factors including the slope geometry, slope height, soil type, and surface pressures, if any. In general, permanent cut and fill slopes, constructed at 1 vertical (V) on 3 horizontal (H), have been observed to perform satisfactorily. Therefore, it is our opinion that, as a minimum, slopes should be constructed at 1V:3H or flatter.

Fill slopes should be constructed by extending the compacted fill beyond the planned slope profile slope and then trimming the slope to the desired configuration.

13. TEMPORARY EXCAVATIONS

Temporary excavation slopes should be constructed per OSHA guidelines. The medium stiff to stiff clay encountered in the borings are generally classified as Type B. The existing uncontrolled fill encountered in teh borings is classified as Type C. These are preliminary classifications and must be confirmed by a “competent person” as defined and required by OSHA. If different subsurface conditions are encountered at the time of construction, they should be evaluated for their potential impact on slope.

14. PAVEMENT SECTION CONSIDERATIONS

Cochran's scope of services did not include extensive sampling and CBR testing of existing subgrade or potential sources of imported fill for the specific purpose of detailed pavement analysis. Instead this report is based on pavement-related design parameters that are considered to be typical for the area soils type.

In large areas of pavement or where pavements are subject to significant traffic, a more detailed analysis of the subgrade and traffic conditions should be made. The results of such a study will provide information necessary to design an economical and serviceable pavement.

The recommended section for parking and drive areas consist of asphalt or concrete pavement over a crushed stone base course layer underlain by 12 inches of compacted subgrade. Proof-rolling should be accomplished to identify soft or unstable soils that should be removed from the pavement area prior to fill placement and /or pavement construction. These soils should be replaced with properly compacted fill as described earlier in this report.

Cochran has estimated the subgrade soils will be prepared to achieve a CBR of at least 3. Based on this value, it is possible to use a locally typical "standard" pavement section as described below.

Section	Thickness, in.				
	Asphalt Pavement			Concrete Alternate	
	Asphalt Wearing	Asphalt Binder	Base Course	Concrete	Base Course
Standard Duty)	2	2	8	5	4
Heavy Duty	2	3	10	6	4

It may be prudent to consider the use of concrete–paved entrances, where forces imposed by turning traffic can generate deformations in asphalt pavement. We recommend concrete entrance pavements with a

thickness of 6 inches. We recommend placement of at least a 4–inch–thick layer of crushed stone base course beneath all concrete pavements and sidewalks.

A. Asphalt. The asphaltic concrete for each pavement section should conform to the requirements of the *Missouri Department of Transportation (MoDOT) Standard Specifications for Road and Bridge Construction,* Section 401, Asphaltic Concrete Pavement.
.

B. Granular Base Course. The base course should consist of MoDOT Type 5 aggregate (as specified in Section 1007 of the Missouri S*tandard Specifications for Highway Construction*), compacted to at least 95 percent of the material's standard Proctor maximum dry density. It is recommended that the base course material be within the range of 8 ± 2 percent to facilitate achieving compaction.

C. Concrete. Materials for the concrete pavement sections should meet the requirements of Pavement Concrete in Section 501 of MoDOT specifications *(Missouri Standard Specifications for Highway Constructions*).

D. Pavement Subgrade. The subgrade should be shaped to prevent ponding if pavements are not constructed immediately after grading. Minor ponding, even short durations, can cause softening of a soil subgrade to a significant depth. The pavement subgrades may be subjected to construction traffic and exposure to weather for an extended period. Therefore, it may be necessary to proofroll the subgrade, in both cut and fill areas and recompact the subgrade immediately prior to placing base rock for the pavement. Soft areas should be selectively undercut and backfilled with properly compacted cohesive soil of the same type present in the subgrade, possibly combined with a geotextile or geogrid. Proofroll passes should be limited, particularly on silty subgrades to reduce the potential for pumping of moisture from deeper within the soil profile. The asphaltic concrete surface course should be checked during placement to verify density and total thickness.

E. Pavement Drainage & Maintenance. Cochran recommends pavement be sloped to provide rapid surface drainage. Water allowed to pond on or adjacent to the pavement could saturate the subgrade, causing premature deterioration of the pavements and may require removal and replacement. Cochran recommends the subgrade be sloped to drain prior to placing the crushed stone base. Consideration should be given to the use of interceptor drains to collect and removed water collecting in the crushed stone base. The interceptor drains could be incorporated with the storm drains of other utilities located in the pavement areas.

15. RECOMMENDED CONSTRUCTION SERVICES

The conclusions and recommendations given in this report are based on interpretation of exploration data and Cochran's experience. The client must recognize variations may occur from conditions observed in the borings, particularly within existing fills or previously developed areas. The design recommendations are based on data from borings, sampling and related procedures. Actual subsurface conditions may vary from those encountered in the 7 borings. Therefore, design recommendations are subject to adjustment in the field, based on subsurface conditions encountered during construction.

The following list highlights Cochran's recommendation for a construction monitoring program. These services are recommended to provide quality assurance in assessing design assumptions and to document procedures for compliance with plans, specifications, and good engineering practice. Cochran should be retained to:

A. Review grading and foundation plans to observe that recommendations given in this report have been correctly implemented.

B. Assess the suitability of potential fill materials, including both on-site and off-site sources (if applicable)

C. Monitor placement of structural fill and backfill.

D. Observe foundation excavations to verify that suitable bearing materials are present.

E. Observe floor slab subgrades to assess the impact of medium and high plastic clay soils and to recommend the extent of remedial measures.

F. Provide testing services during pavement construction.

Construction observation is intended to enhance compliance with project plans and specifications. It is not insurance, nor does it constitute a warranty or guarantee of any type. In all cases, contractors, etc., are solely responsible for the quality of their work and for adhering to plans and specifications.

16. LIMITATIONS OF REPORT

The recommendations provided herein are for the exclusive use of the client for specific application to the named project as described herein. They are not meant to supersede more stringent requirements of local ordinances. They are based on the subsurface information obtained at seven specific borings within the project area, our understanding of the project and geotechnical engineering practice consistent with the standard of care. If this report is provided to prospective contractors, the client should make it clear that the information is provided for factual data only and not as a warranty of subsurface conditions included in this report.

This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until, during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of our services for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic material in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the soil logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client.

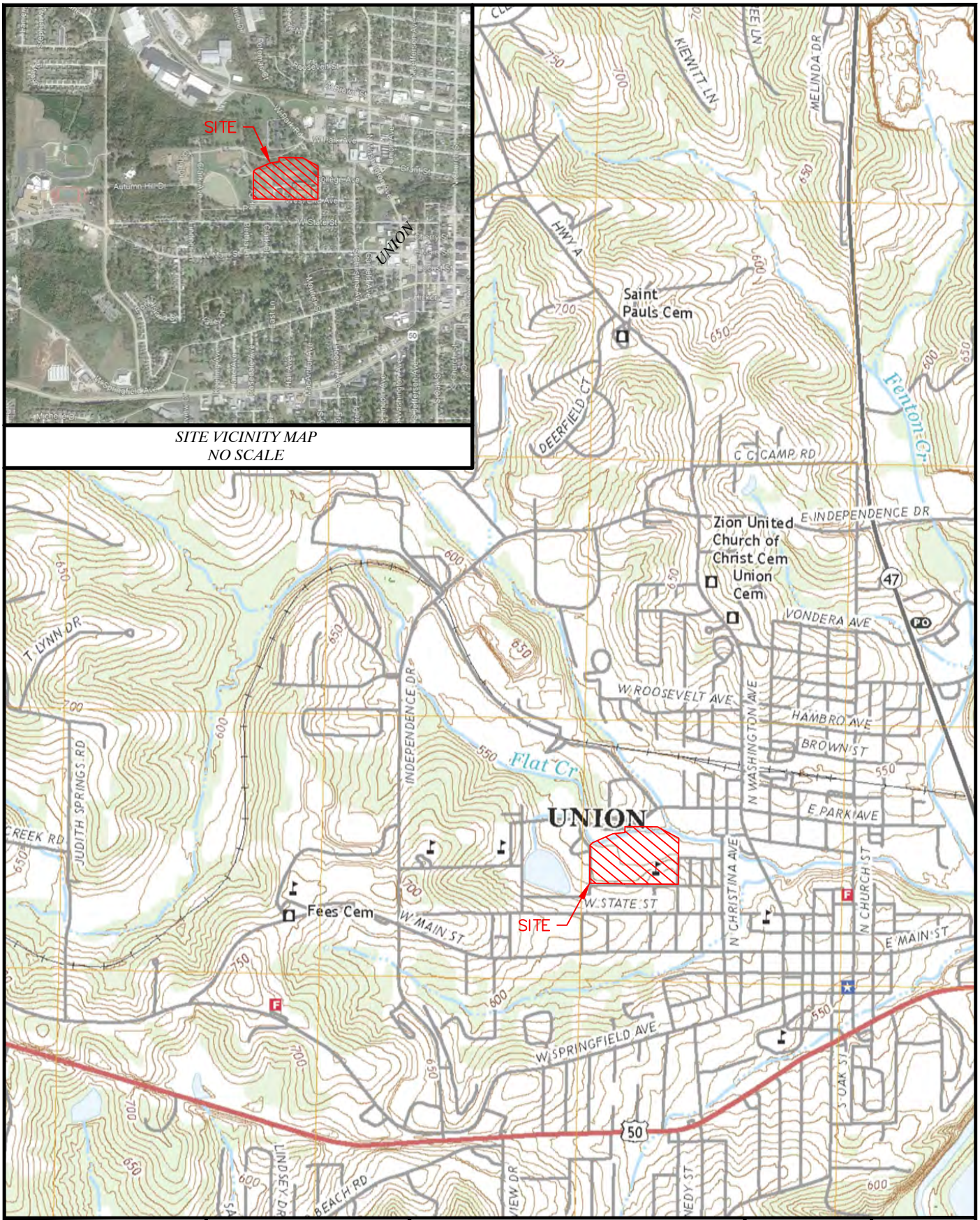
Cochran should be provided with a set of final development plans as soon as they are available for review to determine the applicability of our recommendations. Failure to provide these documents may nullify some or all of the recommendations provided herein. In addition, any changes in the planned project or changed site conditions may require revised or additional recommendations on our part.

Cochran should be retained to perform construction observation and complete its geotechnical engineering service using the observational methods. Cochran cannot assume responsibility or liability for the adequacy of its recommendations when they are used in the field without Cochran being retained to observe construction.

ILLUSTRATIONS

VICINITY AND TOPOGRAPHIC MAP

SITE VICINITY MAP
NO SCALE



GENERAL NOTES / LEGEND

USGS TOPOGRAPHIC MAP
UNION, MO – 2017
10' CONTOURS
GOOGLE MAPS

VICINITY & TOPOGRAPHIC MAP

UNION MIDDLE SCHOOL ADDITION

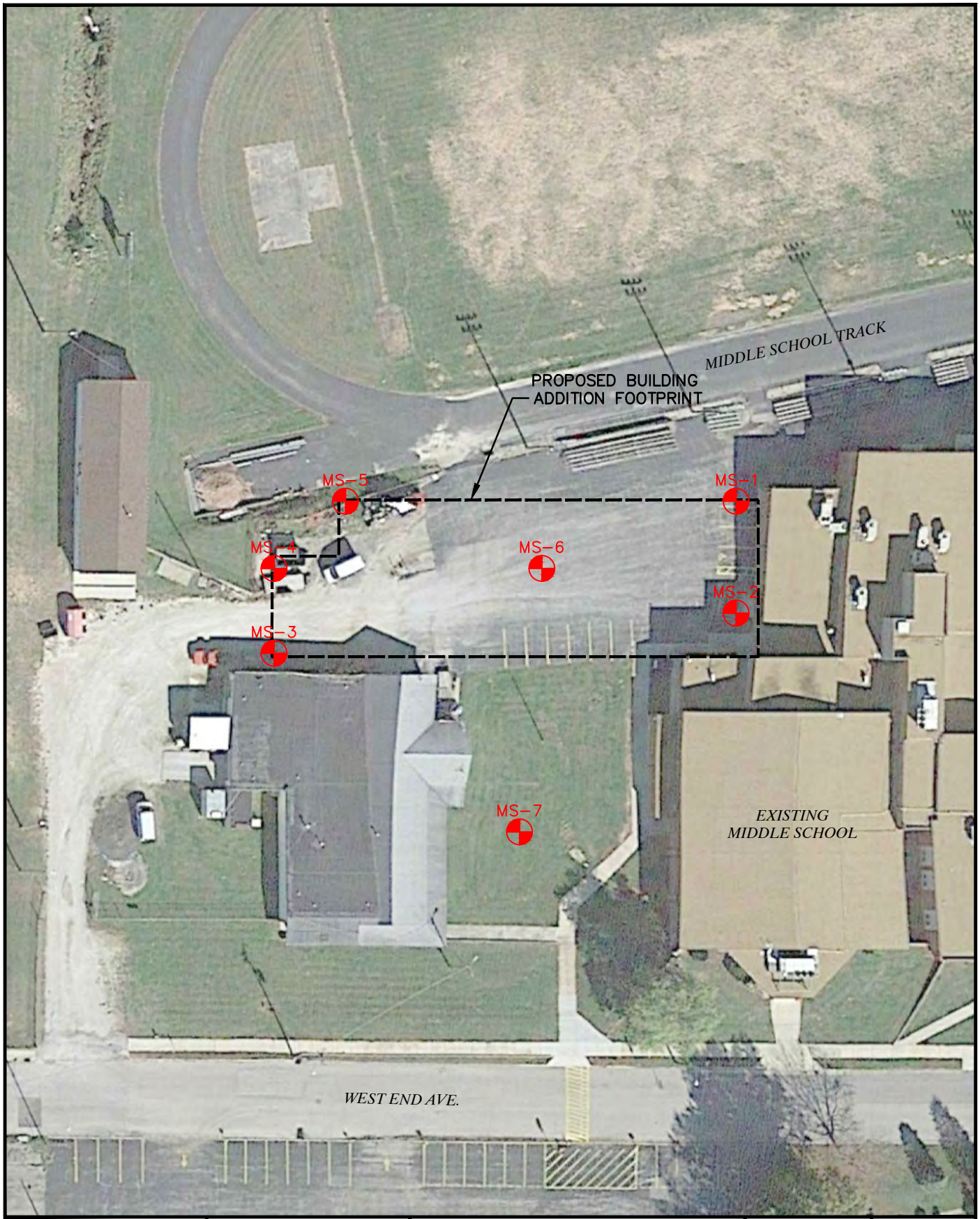
UNION, MISSOURI

DWN. BY:	APPD. BY:
JMM	KLA

DATE: JULY 31, 2018
SCALE: 1"=1,600'
PROJ. NO: 18-7368G
PLATE: *1*

ILLUSTRATIONS

SITE AND BORING LOCATIONS



COCHRAN

GENERAL NOTES / LEGEND

GOOGLE EARTH

BOREHOLE MS-#

SITE & BORING LOCATIONS

UNION MIDDLE SCHOOL ADDITION

UNION, MISSOURI

N

DWN. BY:	APP'D. BY:
JMM	KLA

DATE: JULY 31, 2018

SCALE: 1"=60'

PROJ. NO: 18-7368G

PLATE: 2

APPENDIX A

DETAILED LOGS OF BORINGS MS-1 THROUGH MS-7
BORING LOG: LEGEND AND NOMENCLATURE

LOG OF BORING NO. **MS-1**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 11.0 ft

SURFACE ELEVATION: 538.0ft

ELEVATION, ft	DEPTH, ft	DESCRIPTION	SAMPLES	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	SPT N-VALUE blows per foot
538.0	0									
537.8		ASPHALT - 3 inches								
537.2		ROCK BASE - 5 inches								
		FILL - gray, low plastic silty clay			28					3
534.0		Very stiff, grayish brown, medium plastic clay with sand and rock fragments - CL-CH		100	23	40	19	21		
	5				16					34
530.0		Medium stiff, sandy CLAY - CLS			14					8
	10									
527.5		Highly weathered LIMESTONE								
527.0		Auger refusal encountered at 11 feet								
	15									
	20									
	25									

UNDRAINED SHEAR STRENGTH, tsf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
: FREE WATER ENCOUNTERED AT 5.0 FT. DURING DRILLING.

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

LOG OF BORING NO. **MS-2**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 14.5 ft

ELEVATION, ft	DEPTH, ft	DESCRIPTION	SAMPLES	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	SPT N-VALUE blows per foot
		SURFACE ELEVATION: 540.5ft								
540.5	0									
540.3		ASPHALT - 2 inches								
539.7		ROCK BASE - 6 inches								
		FILL - gray, low plastic silty clay			29					4
537.0		Medium stiff to stiff, grayish brown, high plastic clay - CH			20					7
	5				23					9
		with sand and rock fragments			13					19
	10									
527.5		Highly weathered LIMESTONE			10					50/3"
526.0		Auger refusal encountered at 14.5 feet								
	15									
	20									
	25									

UNDRAINED SHEAR STRENGTH, tsf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
: FREE WATER ENCOUNTERED AT 13.0 FT. DURING DRILLING.

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

LOG OF BORING NO. **MS-3**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 22.5 ft

SURFACE ELEVATION: 545.0ft

ELEVATION, ft	DEPTH, ft	DESCRIPTION	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	SPT N-VALUE blows per foot
545.0	0	Gravel - 10 inches			
544.1		FILL - brownish grey, low plastic, silty clay		21	9
			94	26	
540.5	5	Stiff, brown to grey, high plastic CLAY - CH		27	9
				21	11
	10	with sand and rock fragments			
				23	9
	15				
527.0		Very soft, brown, high plastic clay with sand - CH		26	0
	20				
524.5		Highly weathered LIMESTONE			
522.5		Auger refusal encountered at 22.5 feet			
	25				

UNDRAINED SHEAR STRENGTH, tsf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
: FREE WATER ENCOUNTERED AT 11.0 FT. DURING DRILLING.

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

LOG OF BORING NO. **MS-4**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 16.5 ft

SURFACE ELEVATION: 543.0ft

ELEVATION, ft	DEPTH, ft	DESCRIPTION	SPT N-VALUE blows per foot
543.0	0	Gravel - 7 inches	
542.4		FILL - brownish gray, high plastic clay	10
540.0	5	FIll - gray, low plastic, silty clay	4
537.5		Stiff, brownish gray, high plastic CLAY - CH	10
	10		11
			10
528.5	15	Highly weathered LIMESTONE	
526.5		Auger refusal encountered at 16.5 feet	
	20		
	25		

SAMPLES

DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
	22				
	25				
	20				
	18				
	22				

UNDRAINED SHEAR STRENGTH, tsf

- ○ HAND PENETROMETER
- △ TORVANE
- ● UNCONFINED COMPRESSION
- ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL

0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
NO FREE WATER ENCOUNTERED DURING DRILLING

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

LOG OF BORING NO. **MS-5**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 11.0 ft

SURFACE ELEVATION: 538.0ft

ELEVATION, ft	DEPTH, ft	DESCRIPTION	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	SPT N-VALUE blows per foot
538.0	0	Gravel - 8 inches						
537.3		Stiff, brownish gray, low plastic SILT - ML	21	24	21	3		10
535.0		Medium stiff to very stiff, brownish gray, high plastic CLAY -CH	22					9
	5	with trace sand and rock fragments	21					8
528.5	10	Highly weathered LIMESTONE	21					40
527.0		Auger refusal encountered at 11 feet						

UNDRAINED SHEAR STRENGTH, tsf
HAND PENETROMETER
TORVANE
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL
0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
NO FREE WATER ENCOUNTERED DURING DRILLING

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

LOG OF BORING NO. **MS-6**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 14.0 ft

ELEVATION, ft	DEPTH, ft	DESCRIPTION	SAMPLES	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	SPT N-VALUE blows per foot
		SURFACE ELEVATION: 541.0ft								
541.0	0	ASPHALT - 5 inches								
540.6		ROCK BASE - 6 inches								
540.1		FILL - gray, low plastic silty clay			28					3
					24	37	21	16		5
536.5	5	Very stiff, grayish brown, high plastic clay - CH								
		with rock fragments		100	23					
					13					18
	10									
529.5		Highly weathered LIMESTONE								
527.0		Auger refusal encountered at 14 feet								
	15									
	20									
	25									

UNDRAINED SHEAR STRENGTH, tsf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
: FREE WATER ENCOUNTERED AT 10.0 FT. DURING DRILLING.

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

LOG OF BORING NO. **MS-7**

Cochran Engineering

PROJECT: Middle School Addition
LOCATION: Union, MO
PROJECT NO.: 18-7368G
DATE: 7-17-18 COMPLETION DEPTH : 17.0 ft

ELEVATION, ft	DEPTH, ft	SYMBOL	DESCRIPTION	SAMPLES	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	SPT N-VALUE blows per foot
			SURFACE ELEVATION: 544.0ft								
544.0	0		Stiff, brownish gray, high plastic CLAY - CH			29	46	25	21		9
						24					7
	5					25					8
			with sand and rock fragments			23					11
	10										
						19					7
	15										
528.0			Highly weathered LIMESTONE								
527.0			Auger refusal encountered at 17 feet								
	20										
	25										

UNDRAINED SHEAR STRENGTH, tsf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
0.5 1.0 1.5 2.0 2.5

WATER OBSERVATIONS:
: FREE WATER ENCOUNTERED AT 11.0 FT. DURING DRILLING.

LOG A GNGN05 - LOG A GNGN05.GDT - 9/12/18 14:31 - M:_EMPLOYEE FOLDERS\KAREN\GINT\PROJECTS\18-7368G - MIDDLE SCHOOL ADDITION.GPJ

Architecture • Civil Engineering • Land Surveying • Site Development • Geotechnical Engineering • Inspection & Materials Testing

BORING LOG: LEGEND & NOMENCLATURE

General Notes:

1. **Information on each boring log** is a compilation of subsurface conditions based on soil and/or rock classifications obtained from the field as well as from laboratory testing of the samples. The strata lines on the logs may be approximate or the transition between the strata may be gradual rather than distinct.
2. **Water level measurements** refer only to those observed at the time indicated and may vary with time, geologic condition or construction activity.

Drilling Method

HSA	Hollow-stem Auger
HA	Hand Auger
MR	Mud Rotary
SF	Solid Flight Auger

Sampling Method

PP	Pocket Penetrometer
GB	Grab Sample Taken From Auger Cuttings
TV	Torvane
CS	Continuous Sampler
ST	Three Inch Diameter Shelby Tube Sample (ASTM D 1587)
SS	Split Spoon Sample (Standard Penetration Test)
NX	NX Rock Core Sample; percent recovery and RQD reported (ASTM D 2113)

Standard Penetration Test – (SPT or N-value) is the standard penetration resistance based on the number of blows, using a 140-lb. Hammer with 30-inch free fall, required to drive a split spoon the last two of three, 6-inch drive increments. Driving is limited to 50 blows within any 6-inch interval. Samples which have not driven the full 6-inch interval upon-completing 50 blows are considered to have reached "split spoon refusal."

General Order of Classification Terms

Relative density or consistency * color * soil constituents * organics * odor * other

Density of Granular Soils

Descriptive Term	N-Value
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

Consistency of Fine-Grained Soils

Consistency	Undrained Shear Strength – Tons Per Square Ft.	Field Test	Approximate N-Value Range
Very Soft	less than 0.12	Thumb will penetrate soil more than 1"	0-1
Soft	0.13 to 0.25	Thumb will penetrate soil about 1"	2-4
Medium Stiff	0.26 to 0.50	Thumb will penetrate soil about ¼"	5-8
Stiff	0. 51 to 1.00	Thumb hardly indents soil	9-15
Very Stiff	1.01 to 2.00	Thumb will not indent soil, but readily Indented with thumbnail	16-30
Hard	greater than 2.00	Thumbnail will not indent soil	>30

Relative Composition

Trace	0-10%
With/Some	11-35%
Soil modifier such as Silty, clayey, sandy, etc.	>35%

Soil Grain Size

U.S. Standard Sieve

12"	3"	3/4"	4	10	40	200	
Boulders	Cobbles	Gravel		Sand			Silt / Clay
		Coarse	Fine	Coarse	Medium	Fine	
300	76.2	19.1	4.76	2.00	0.42	0.074	.002

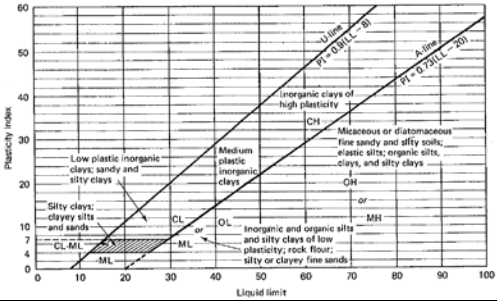
Soil Grain Size in Millimeters

Unified Soil Classification System

Soil Classifications of the samples are made by visual inspection and/or laboratory test results in accordance with the Unified Soil Classification System (ASTM Designations D-2487 and D-2488). Visual estimates are approximate only. If laboratory tests were performed to classify the soil, the unified designation is shown in parenthesis.

MAJOR DIVISIONS			SYMBOL	DESCRIPTION
Coarse-Grained Soils (more than 50% Larger than No. 200 Sieve Size)	Gravel and Gravelly Soils	Clean Gravels Little or No Fines	GW	Well-Graded Gravel, Gravel-Sand Mixture
			GP	Poorly-Graded Gravel, Gravel-Sand Mixture
		Gravels with Appreciable Fines	GM	Silty Gravel, Gravel-Sand-Silt Mixture
			GC	Clayey-Gravel, Gravel-Sand-Clay Mixture
	Sand and Sandy Soils	Clean Sands Little or No Fines	SW	Well-Graded Sand, Gravelly Sand
			SP	Poorly-Graded Sand, Gravelly Sand
		Sands with Appreciable Fines	SM	Silty Sand, Sand-Silt Mixture
			SC	Clayey Sand, Sand-Clay Mixture
Fine-Grained Soils (more than 50% Smaller than No. 200 Sieve Size)	Silts and Clays	Liquid Limit Less Than 50	ML	Silt, Clayey Silt, Silty or Clayey Very Fine Sand, Slight Plasticity
			CL	Clay, Sandy Clay, Silty Clay, Low to Medium Plasticity
			OL	Organic Silts or Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit More Than 50	MH	Silty, Fine Sandy or Silty Soil with High Plasticity
			CH	Clay, High Plasticity
			OH	Organic Clay or Medium to High Plasticity
	Highly Organic Soils		PT	Peat, Humus, Swamp Soil

PLASTICITY CHART



8 East Main Street, Wentzville, MO 63385, Phone: 636-332-4574, Fax: 636-327-0760

737 Rudder Road, Fenton, MO 63026, Phone: 314-842-4033, Fax: 314-842-5957

530A East Independence Drive, Union, MO 63084, Phone: 636-584-0540, Fax: 636-584-0512

534 Maple Valley Drive, Farmington, MO 63640, Phone: 573-315-4810, Fax: 573-315-4811

767 North 20th Street, Ozark, MO 65721, Phone: 417-595-4108, Fax: 417-595-4109

905 Executive Drive, Osage Beach, MO 65065, Phone: 573-525-0299, Fax: 573-525-0298

www.cochraneng.com

APPENDIX B

LABORATORY RESULTS

COCHRAN

Determining Minimum Laboratory Soil Resistivity, (AASHTO T 288)
Determining pH of Soil for Use in Corrosion Testing, (AASHTO T 289)

AASHTO R18

Architecture ● Civil Engineering ● Land Surveying ● Site Development ● Geotechnical Engineering ● Inspection & Materials Testing

Project Name:	Union Middle School	Material:	CL	Sample ID No.:	4964
Cochran Job No.:	18-7368G	Ledges:	N/A	Sample Time:	
MoDOT Job No.:	N/A	Sampled At:	MS-1	Sample Date:	July 16, 2018
Client:	Union Schools	Sampled From:	3'-5'	Delivered to Lab:	July 18, 2018
County:	Franklin	Station/Quantity:	N/A	Date Tested:	July 31, 2018
Material Source:	On-Site	Sampled By:	N/A	Tested By:	T. Beuke

pH: 7.43

Measurement	Resistance (ohm)	Soil Box Factor (cm)	Soil Resistivity (ohm-cm)
1	8000	1	8000
2	15000	1	15000
3	12000	1	12000
4	11000	1	11000
5	13000	1	13000
6	14000	1	14000

8 East Main Street
Wentzville, MO 63385
Phone: 636-332-4574
Fax: 636-327-0760

737 Rudder Road
Fenton, MO 63026
Phone: 314-842-4033
Fax: 314-842-5957

530A East Independence Drive
Union, MO 63084
Phone: 636-584-0540
Fax: 636-584-0512

534 Maple Valley Drive
Farmington, MO 63640
Phone: 573-315-4810
Fax: 573-315-4811

767 North 20th Street
Ozark, MO 65721
Phone: 417-595-4108
Fax: 417-595-4109

905 Executive Drive
Osage Beach, MO 65065
Phone: 573-525-0299
Fax: 573-525-0298

www.cochraneng.com

Missouri
Division of Labor Standards

WAGE AND HOUR SECTION

ERIC R. GREITENS, Governor

Annual Wage Order No. 25

Section 036

FRANKLIN COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Matt Cowell, Director
Division of Labor Standards

Filed With Secretary of State: **March 9, 2018**

Last Date Objections May Be Filed: **April 9, 2018**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	** Date of Increase	*	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits
Asbestos Worker (H & F) Insulator			$38.70	55	60	$23.17
Boilermaker	6/18		$36.41	126	7	$30.81
Bricklayer and Stone Mason	6/18		$33.25	72	5	$23.57
Carpenter	6/18	d	$38.79	93	42	$17.50
Cement Mason	6/18	e	$31.49	80	6	$19.00
Communication Technician			$33.21	44	47	$20.24
Electrician (Inside Wireman)			$36.92	82	71	$10.84 + 39%
Electrician (Outside-Line Construction\Lineman)			$44.56	43	45	$5.75 + 36%
Lineman Operator			$38.35	43	45	$5.75 + 36%
Groundman			$29.48	43	45	$5.75 + 36%
Elevator Constructor	6/18	a	$48.54	26	54	$34.395
Glazier			$34.55	87	31	$26.20
Ironworker			$33.96	11	8	$25.745
Laborer (Building):						
General		c	$28.66	113	3	$13.07
First Semi-Skilled		b	$28.86	113	3	$13.07
Second Semi-Skilled		b	$28.86	113	3	$13.07
Lather			USE CARPENTER RATE			
Linoleum Layer and Cutter	6/18		$33.43	92	26	$17.00
Marble Mason			$32.12	76	51	$15.25
Marble Finisher			$26.67	76	51	$14.48
Millwright	6/18		$38.85	77	41	$17.31
Operating Engineer						
Group I	6/18		$32.96	3	66	$27.43
Group II	6/18		$32.96	3	66	$27.43
Group III	6/18		$31.06	3	66	$27.43
Group III-A	6/18		$32.96	3	66	$27.43
Group IV	6/18		$27.60	3	66	$27.43
Group V	6/18		$27.60	3	66	$27.43
Painter			$33.40	104	12	$14.26
Pile Driver			USE CARPENTER RATE			
Pipe Fitter			$39.25	91	69	$27.18
Plasterer			$31.81	67	3	$18.68
Plumber			$39.25	91	69	$27.18
Roofer \ Waterproofer			$32.70	15	73	$17.97
Sheet Metal Worker			$41.55	32	25	$22.72
Sprinkler Fitter - Fire Protection	6/18		$35.84	33	19	$21.42
Terrazzo Worker			$32.40	116	5	$14.26
Terrazzo Finisher			$30.65	116	5	$12.73
Tile Setter			$32.12	76	51	$15.25
Tile Finisher			$26.67	76	51	$14.48
Traffic Control Service Driver			$28.775	22	55	$9.045
Truck Driver-Teamster			$30.41	35	36	$10.82

Fringe Benefit Percentage is of the Basic Hourly Rate

**Annual Incremental Increase

OCCUPATIONAL TITLE	** Date of Increase	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits

* Welders receive rate prescribed for the occupational title performing operation to which welding is incidental.

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

a - Vacation: Employees over 5 years - 8%; Employees under 5 years - 6%
b - Projects over $500,000 - $28.86; Projects under $500,000 - $27.36
c - Projects over $500,000 - $28.66; Projects under $500,000 - $27.16
**d - Projects over $2 Million - $38.79; Projects under $2 Million - $25.40
**e - Projects over $10 Million - $31.49; Projects under $10 Million - $30.79

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

FED: Minimum requirement per Fair Labor Standards Act means time and one-half (1½) shall be paid for all work in excess of forty (40) hours per work week.

NO. 3: Means the regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute lunch period, with pay at the straight time rate. The regular workday shall begin between the hours of 6:00 a.m. and 9:00 a.m. The Employer may have the option to schedule the work week from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be paid at the applicable overtime rate. If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather, holiday or other conditions beyond the control of the Employer, they shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours for the workweek. All overtime work performed on Monday through Saturday shall be paid at time and one-half (1½) the hourly rate plus an amount equal to one-half (½) of the hourly Total Indicated Fringe Benefits. All work performed on Sundays and recognized holidays shall be paid at double (2) the hourly rate plus an amount equal to the hourly Total Indicated Fringe Benefits. Shifts may be established when considered necessary by the Employer. Shift hours and rates will be as follows. If shifts are established, work on the First Shift will begin between 6:00 a.m. and 9:00 a.m. and consist of eight (8) hours of work plus one-half hour unpaid lunch. Hours worked during the first shift will be paid at the straight time rate of pay. The second shift shall start eight hours after the start of the first shift and consist of eight (8) hours of work plus one-half hour unpaid lunch. Work on the second shift will begin between 2:00 p.m. and 5:00 p.m. and be paid the straight time rate plus $2.50 per hour. The third shift shall start eight hours after the start of the second shift and consist of eight (8) hours plus one-half hour unpaid lunch. Work on the third shift will begin between 10:00 p.m. and 1:00 a.m. and be paid the straight time rate plus $3.50 per hour. The additional amounts that are to be paid are only applicable when working shifts. Shifts that begin on Saturday morning through those shifts which end on Sunday morning will be paid at time and one-half these rates. Shifts that begin on Sunday morning through those shifts which end on Monday morning will be paid at double time these rates.

NO. 11: Means eight (8) hours shall constitute a day's work, with the starting time to be established between 6:00 a.m. and 8:00 a.m. from Monday to Friday. Time and one-half (1½) shall be paid for first two (2) hours of overtime Monday through Friday and the first eight (8) hours on Saturday. All other overtime hours Monday through Saturday shall be paid at double (2) time rate. Double (2) time shall be paid for all time on Sunday and recognized holidays or the days observed in lieu of these holidays.

NO. 15: Means the regular working day shall be scheduled to consist of at least eight (8) hours, but no more than ten (10) consecutive hours, exclusive of the lunch period. The regular working day may be scheduled to commence at any time between the hours of 5:00 a.m. and 10:00 a.m. All work performed in excess of forty (40) hours in one work week, or in excess of ten (10) hours in one work day shall be paid at the rate of one and one-half (1½) times the regular hourly wage scale. Any work performed on a Saturday shall be paid for at the rate of one and one-half (1½) times the regular hourly wage scale unless such Saturday work falls under the category of Saturday Make-Up Day. Any work performed by Employees anywhere on Sunday or recognized holidays, shall be paid for at the rate of double (2) time the regular wage scale. If, during the course of a work week, an Employee is unable to work for any reason, and, as a result, that Employee has not accumulated forty (40) hours of compensable time at the straight time rate, the Employer, at his option may offer the Employee the opportunity to work on Saturday at straight time; provided, however, if during the period worked by said Employee on Saturday, the Employee's compensable time at the straight time rate exceeds forty (40) hours, all time worked in excess of the forty (40) hours will be paid at the rate of one and one-half (1½) times the regular hourly wage scale.

NO. 22: Means a regular work week of forty (40) hours will start on Monday and end on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof may be worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A workday is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time may be advanced or delayed if mutually agreed to by the interest parties. For all time worked on recognized holidays, or days observed as such, double (2) time shall be paid.

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 26: Means that the regular working day shall consist of eight (8) hours worked between 6:00 a.m., and 5:00 p.m., five (5) days per week, Monday to Friday, inclusive. Hours of work at each jobsite shall be those established by the general contractor and worked by the majority of trades. (The above working hours may be changed by mutual agreement). Work performed on Construction Work on Saturdays, Sundays and before and after the regular working day on Monday to Friday, inclusive, shall be classified as overtime, and paid for at double (2) the rate of single time. The employer may establish hours worked on a jobsite for a four (4) ten (10) hour day work week at straight time pay for construction work; the regular working day shall consist of ten (10) hours worked consecutively, between 6:00 a.m. and 6:00 p.m., four (4) days per week, Monday to Thursday, inclusive. Any work performed on Friday, Saturday, Sunday and holidays, and before and after the regular working day on Monday to Thursday where a four (4) ten (10) hour day workweek has been established, will be paid at two times (2) the single time rate of pay. The rate of pay for all work performed on holidays shall be at two times (2) the single time rate of pay.

NO. 32: The regular working day shall consist of eight (8) hours of labor on the job between six (6) a.m. and four (4) p.m. and the regular working week shall consist of five (5) consecutive eight (8) hour days of labor on the job beginning with Monday and ending with Friday of each week. The normal work week is 40 hours. All full-time or part-time labor performed during such hours shall be recognized as regular working hours and paid for at the regular hourly rate**.** All work performed during regular work hours on Saturdays will be paid at time and one-half (1½). All work performed outside of regular working hours and performed during the regular work week, shall be at double (2) times the regular rate, except that the first two (2) hours following the regular work day shall be paid at one and one-half (1½) times the regular rate. An early starting time of 6:00 a.m. may be used mutually agreed upon by the interested parties. SHIFT RATE: Shift work would start after 4:00 p.m. to 6:00 a.m. The first 8 hours would be at 115% of the basic wage rate. Overtime Monday through Friday would be at 1½ of base shift rate. Saturday regular work day hours – 1½ of base shift rate. Saturday – work after 8 hours – 2 times the basic wage rate. Sunday and Holidays – 2 times the basic wage rate. All work performed on recognized holidays and Sundays shall be paid double (2) time. Appropriate overtime rates to be based on fifteen minute increments.

NO. 33: Means the standard work day and week shall be eight (8) consecutive hours of work between the hours of 6:00 a.m. and 6:00 p.m., excluding the lunch period Monday through Friday, or shall conform to the practice on the job site. Four (4) days at ten (10) hours a day may be worked at straight time, Monday through Friday and need not be consecutive. All overtime, except for Sundays and holidays shall be at the rate of time and one-half (1½). Overtime worked on Sundays and holidays shall be at double (2) time.

NO. 35: Means a regular work week of forty (40) hours, will start on Monday and end on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof maybe worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A work day is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time maybe advanced or delayed if mutually agreed to by the interested parties. For all time worked on recognized holidays, or days observed as such, double (2) time shall be paid.

NO. 43: Eight (8) hours shall constitute a work day between the hours of 7:00 a.m. and 4:30 p.m. Forty (40) hours within five (5) days, Monday through Friday inclusive, shall constitute the work week. Work performed in the 9th and 10th hour, Monday through Friday, shall be paid at time and one-half (1½) the regular straight time rate of pay. Contractor has the option to pay two (2) hours per day at the time and one-half (1½) the regular straight time rate of pay between the hours of 6:00 a.m. and 5:30 p.m., Monday through Friday. Work performed outside the regularly scheduled working hours and on Saturdays, Sundays and recognized legal holidays, or days celebrated as such, shall be paid for at the rate of double (2) time.

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 44: Means forty (40) hours shall constitute a work week, Monday through Friday. Eight (8) hours shall constitute a work day. Hours of work shall be between the hours of 7:00 a.m. and 4:30 p.m. All work performed before 7:00 a.m. and after 4:30 p.m. and all work performed in excess of eight (8) hours in any one work day, over forty (40) hours in any work week and the first eight (8) hours of work on Saturday, shall be paid at the rate of one and one-half (1½) times the regular rate of pay. All hours worked in excess of eight (8) hours on Saturday, all hours worked on Sunday and on holidays, or days that may be celebrated as such, and as designated by the federal government, shall be paid at two (2) times the regular rate of pay. All shifts for work performed between the hours of 4:30 p.m. and 1:00 a.m. shall receive eight (8) hours pay at the regular hourly rate of pay plus two dollars ($2.00) per clock hour. All work performed between the hours of 12:30 a.m. and 9:00 a.m. on a third shift shall receive eight (8) hours pay at the regular hourly rate plus four dollars ($4.00) per clock hour. All overtime work required after the completion of a regular shift shall be paid at one and one-half times (1½ x) the "shift" hourly rate.

NO. 55: Means the regular work day shall be eight (8) hours between 6:00 a.m. and 4:30 p.m. The first two (2) hours of work performed in excess of the eight (8) hour work day, Monday through Friday, and the first ten (10) hours of work on Saturday, shall be paid at one & one-half (1½) times the straight time rate. All work performed on Sunday, observed holidays and in excess of ten (10) hours a day, Monday through Saturday, shall be paid at double (2) the straight time rate.

NO. 67: Means eight (8) hours shall constitute a day's work, with a flexible starting time to begin between 6:00 a.m. to 8:00 a.m., five (5) days a week, Monday through Friday. Any work over eight (8) hours in any one day shall be at the overtime rate, which is time & one-half (1½). Any work on Saturday shall be at time & one-half (1½), unless a Make-Up Day due to inclement weather is in effect. Any work on Sundays or holidays shall be at double (2) time. Four (4) days, ten (10) hours each day to be worked during Monday through Friday, shall be paid at straight time. A Make-Up Day Due To Inclement Weather Only - Employee(s) will be permitted to work an eight (8) hour make-up day on Saturday only, and the employee will receive the regular straight time wage rate.

NO. 72: Means that except as is otherwise provided herein, the work week shall be determined to begin at 8:00 a.m. Wednesday and end at 4:30 p.m. on the following Tuesday. Except as herein provided, working hours are from 8:00 a.m. to 11:55 a.m. and 12:30 p.m. to 4:25 p.m. and no more than the regular hours shall be worked during the forenoon or afternoon at the regular rate. In the case of days of inclement weather starting time and quitting time may be adjusted so long as the hours worked on such days do not exceed eight (8) and do not extend beyond 4:30 p.m. In circumstances where the Employee or Employees have regularly been working overtime on a particular day or days, no adjustment in the starting time shall operate to deprive Employees of overtime pay, which they would have otherwise received but for the change in the starting time. The parties understand that the application of the provisions of the preceding sentence will result in Employees receiving overtime pay even where they have not worked more than with (8) hours on a particular day. Regardless of the staring time, the forenoon working hours shall end at 11:55 a.m. and the afternoon working hours shall begin at 12:30 p.m. and end 8 hours and 25 minutes after the staring time fixed by the Employer for forenoon hours. Work performed by an employee on a non-holiday Saturday, except as hereinafter provided, or at night or before or after regular working hours on a non-holiday weekday, shall be considered overtime work, for which Employees working during such time shall be paid at the rate of one and one-half (1½) times their regular hourly wage rate for each hour or fraction thereof, worked during such time. Work performed on a Sunday or the recognized holidays shall be considered overtime work for which the Employee shall be paid twice the amount of his or her regular hourly wage rate for each hour or fraction thereof worked on any such day.

NO. 76: Means the standard workday shall consist of eight (8) hours of work between the hours of 8:00 a.m. and 4:30 p.m. with a thirty (30) minute unpaid lunch hour occurring in the middle of the shift. The standard workweek shall consist of five standard workdays commencing on Monday and ending on Friday. The normal starting and quitting times may be changed by mutual consent of interested parties. All time worked before and after the established eight (8) hour workday, Monday through Friday, and all time worked on Saturday, shall be paid for at the rate of time & one-half (1½) the hourly base wage rate in effect. All time worked on Sunday and holidays shall be paid at the rate of double (2) the hourly wage in effect. All work done on Saturday will be done at time & one-half (1½), unless Saturday shall be used as a make-up day. If an employee should lose one or more days in a work week and use Saturday as a make-up day the pay shall be at the regular hourly base wage rate and benefits.

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 77: Means the regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute lunch period, with pay at the regular straight time hourly rate. The regular workday shall begin on the job site between the hours of 6:00 a.m. and 8:00 a.m. with the starting time to be determined by the Employer, unless project owner requires different starting time. This adjustable starting time can, at the Employer's option, be staggered to permit starting portions of the work force at various times within the prescribed hours. The Employer may establish a four (4) ten (10) hour shift exclusive of the thirty (30) minute lunch period at the straight time wage rate. Forty (40) hours per week shall constitute a week's work Monday through Thursday. In the event a job is down due to weather conditions, safety or other conditions beyond the control of the Employer, then Friday may, at the option of the employer, be worked as a make-up day at the straight time wage rate. Straight time is not to exceed ten (10) hours a day or forty (40) hours per week. Time and one-half (1 ½) shall be paid for all overtime hours worked during the week, Monday through Friday and for all work performed on Saturday. Double (2) time shall be paid for all time worked on Sunday and recognized holidays.

NO. 80: Means eight (8) hours shall constitute the regular work day and forty (40) hours a work week, Monday through Friday. The Employer shall establish the starting time between 6:30 a.m. through 9:00 a.m. An Employer may further adjust the starting time up to 9:30 a.m. throughout the year. Time and one-half (1½) shall be paid after eight (8) consecutive hours worked after the established starting time and for hours worked before the established starting time. Time and one-half (1½) shall be paid for work performed on Saturdays. Work performed on Sundays and Holidays shall be paid at the double (2) time rate of pay. The Employer when working on Highway and Road Work may have the option to schedule the work week for his paving crew only from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate of time and one-half (1½). If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), the Employer shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours.

NO. 82: Means the work day shall consist of eight (8) hours worked between 7:00 a.m. and 4:30 p.m. Forty (40) hours will constitute the work week from Monday through Friday, inclusive. Up to four (4) hours of overtime work per day performed before or after the assigned normal work day, (twelve (12) continuous hours, starting no earlier than 6:00 a.m., Monday through Friday), shall be paid at a rate of one and one-half times (1.5x) that employee's hourly rate. Any additional overtime, Monday through Friday, shall be paid at two times (2x) the regular rate of pay. The first eight hours of overtime work on Saturday shall be paid at the rate of one and one-half times (1.5x) the regular rate of pay. Hours worked in excess of eight (8) hours on Saturday shall be paid at two times (2x) the regular rate of pay. Double time shall be paid for work performed on Sundays, recognized legal holidays or days that may be celebrated as such as designated by the federal government. All shifts for work performed between the hours of 4:30 p.m. and 1:00 a.m. shall be paid at the regular hourly rate plus two dollars ($2.00) per clock hour. All shifts for work performed between the hours of 12:30 a.m. and 9:00 a.m. shall be paid at the regular hour rate plus four dollars ($4.00) per clock hour. All overtime work required after the completion of a regular shift shall be paid at one and one-half times (1.5x) the "shift" hourly rate.

NO. 87: Means eight (8) hours starting between 6:00 a.m. and 8:00 a.m. and ending between 2:30 p.m. and 4:30 p.m. at the Employers discretion shall constitute a day's work. Any work prior to 6:00 a.m. or after eight (8) hours shall be paid at the overtime rate. Five (5) days from Monday through Friday inclusive shall constitute a regular work week. All hours before and after these regular hours shall be considered overtime and shall be paid for at the rate of double (2) time. All work on Saturday and Sunday shall be paid at double (2) the prevailing scale of wages.

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 91: Means eight (8) hours shall constitute a day's work commencing at 7:00 a.m. and ending at 3:30 p.m., allowing one-half (½) hour for lunch. The option exists for the Employer to use a flexible starting time between the hours of 6:00 a.m. and 9:00 a.m. The regular workweek shall consist of forty (40) hours of five (5) workdays, Monday through Friday. The workweek may consist of four (4) ten (10) hour days from Monday through Thursday, with Friday as a make-up day. If the make-up day is a holiday, the employee shall be paid at the double (2) time rate. The employees shall be paid time and one-half (1½) for work performed on Saturdays**,** before the regular starting time or after the regular quitting time or over eight (8) hours per work day (unless working a 10-hour work day, then time and one-half (1½) is paid for work performed over ten (10) hours a day) or over forty (40) hours per work week. Work performed on Sundays and recognized holidays shall be paid at the double (2) time rate of pay. SHIFT WORK: When it is necessary for the project to operate in shifts, there will be three (3) eight (8) hour shifts commencing at 8:00 a.m. Shift work must continue for a period of not less than three (3) consecutive work days, two (2) days which must be regular work days (Monday through Friday). In the event the second or third shift of any regular work day shall fall into a Saturday or a holiday, such extension into a Saturday or holiday shall be considered as part of the previous workday and employees shall be paid at the regular shift rate. The first day shift shall work a regular eight (8) hour day at regular rates. The second shift shall be eight (8) hours regular time pay plus $2.50 per hour premium for eight (8) hours work. Third shift will be for eight (8) hours regular time pay plus $3.00 per hour premium for eight (8) hours work.

NO. 92: Means all work performed from 8:00 a.m. to 4:30 p.m., Monday through Friday, will be at straight time pay up to forty (40) hours per week. All work performed Monday through Friday before 8:00 a.m. and after 4:30 p.m. will be done at time and one-half (1½). All work done on Saturday will be done at time and one-half (1½), unless the employer and employee agree that Saturday shall be used as a make-up day. The Employer may use a flexible starting time of 7:00 a.m. to 8:00 a.m., and quitting time of 3:30 p.m. to 4:30 p.m., and any such different work starting time shall determine whether wages are payable at the straight rate or the premium rate. All work performed on Saturday shall be paid for at time and one-half (1½), unless the Saturday has been used as a make-up day. All work performed on Sunday and holidays shall be paid for at the rate of double (2) time.

NO. 93: Means the regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute lunch period, with pay at the regular straight time hourly rate. The regular workday shall begin on the job site between the hours of 6:00 a.m. and 8:00 a.m. with the starting time to be determined by the Employer, unless project owner requires different starting time. This adjustable starting time can, at the Employer's option, be staggered to permit starting portions of the work force at various times within the prescribed hours. The Employer may establish a four (4) ten (10) hour shift exclusive of the thirty minute unpaid lunch period at the straight time wage rate. Forty (40) hours per week shall constitute a week's work Monday through Thursday. In the event a job is down due to weather conditions, safety or other conditions beyond the control of the Employer, then Friday may, at the option of the Employer, be worked as a makeup day at the straight time wage rate. Straight time is not to exceed ten (10) hours a day or forty (40) hours per week. Starting time will be designated by the Employer. Time and one-half (1½) shall be paid for all overtime hours worked during the week, Monday through Friday and for all work performed on Saturday. Double (2) time shall be paid for all time worked on Sunday and all recognized holidays.

NO. 104: Means eight (8) hours per day shall constitute a standard work day between the hours of 6:00 a.m. and 8:00 p.m. The standard work week shall be forty (40) hours between 6:00 a.m. on Monday and ending 8:00 p.m. on Friday. An overtime rate of time and one-half (1½) the base hourly rate shall be paid on all hours in excess of eight (8) hours in a day Monday through Friday. Saturdays shall be considered overtime and work done on Saturday shall be paid at time and one-half (1½) the prevailing scale. Sundays and holidays shall be considered overtime and work done on these days shall be paid at double (2) the prevailing scale.

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 113: The regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute lunch period, with pay at the regular straight time hourly rate. The regular workday shall begin on the job site between 6:00 a.m. and 9:00 a.m. Overtime rates shall not be broken down into less than thirty (30) minute units of time. The Employer shall have the option of working five (5) eight (8) hour days or four (4) ten (10) hour days, Monday through Friday. If an Employer elects to work five (5) eight (8) hour days during any work week, hours worked more than eight (8) per day or forty (40) per week shall be paid at time and one-half (1½) the hourly rate Monday through Friday. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof, by reason of inclement weather, Saturday or any part thereof may be worked as a make-up day at the straight time rate. The Employer may establish a four (4) ten (10) hour shift exclusive of the thirty (30) minute unpaid lunch period at the straight time wage rate. Forty (40) hours per week shall constitute a week's work, Monday through Thursday. In the event a job is down due to weather conditions, holiday, or other conditions beyond the control of the Employer, then Friday may, at the option of the Employer, be worked as a make-up day at the straight time wage rate. Straight time is not to exceed ten (10) hours a day or forty (40) hours per week. If an Employer elects to work eight (8) hour days and loses a day due to inclement weather, he may work ten (10) hour days the remainder of the week at straight time. In the event the Laborer working is assisting another craft being paid overtime wage rates, the laborer will receive time and one-half (1½) for hours worked on Saturday. Sundays and recognized Holidays or days observed as such, shall be paid at the double (2) time rate. Projects That Cannot Be Performed During Regular Workday: If required by owner, the contractor may perform work outside the normal work hours, and employees shall be paid the applicable straight time hourly wage rate plus a premium of ($2.50) per hour for the first eight hours worked. Any hours worked in excess of eight (8) hours shall be paid at the applicable overtime rate plus the ($2.50) per hour premium. Shift work: Shifts shall be established for a minimum of three (3) consecutive workdays. Shift hours will be defined as: First shift eight (8) hours including thirty (30) minutes for lunch. Second shift-eight (8) hours including thirty (30) minutes for lunch. Third shift eight (8) hours including thirty (30) minutes for lunch. The first shift will be paid at eight (8) hours straight time. The second shift will be paid eight (8) hours straight time plus a two dollar and fifty cent ($2.50) per hour premium, and the third shift shall be paid eight (8) hours straight time plus a three dollar and fifty cent ($3.50) per hour premium. Payment for shift work shall be determined by when an Employer first begins his shift operation, i.e., the shifts which begin on Friday morning and end on Saturday morning will be paid at straight time; the shifts which start on Saturday morning and end on Sunday morning will be paid at time and one-half (1½); the shifts which start on Sunday morning and end on Monday morning will be paid at double time. Employees working during the normal workday shall receive first shift pay; employees working predominantly during the evening hours shall receive second shift pay; employees working predominately during the early morning hours shall receive third shift pay.

NO. 116: Means the standard work day shall consist of eight (8) hours of work between the hours of 8:00 a.m. and 4:30 p.m. The standard work week shall consist of five standard work days commencing on Monday and ending on Friday inclusive. All time worked before and after the established eight (8) hour work day, Monday through Friday, and all time worked on Saturdays, shall be paid for at the rate of time & one-half (1½) the hourly base wage rate in effect. All time worked on Sundays and recognized holidays shall be paid for at the rate of double (2) the hourly base wage rate in effect.

NO. 123: Means except as provided, eight (8) hours a day (8:00 A.M. to 4:30 P.M.) shall constitute a standard work day, excluding the 30-minute lunch period, and forty (40) hours per week shall constitute a week's work. All time worked outside of the standard work day and on Saturday shall be classified as overtime and paid the rate of time and one-half (except as herein provided). All time worked on Sunday and herein named holidays shall be classified as overtime and paid at the rate of double time. The Employer has the option of working either five (5) eight-hour days or four (4) ten-hour days to constitute a normal forty (40) hour work week. When the four (4) day ten-hour work week is in effect, the standard work week shall consist of forty (40) hours, Monday through Friday, which will consist of any four (4) consecutive ten (10) hour days within the five day period. In the event the job is down for any reason beyond the control of the Employer, then Friday and/or Saturday may, at the option of the Employer, be worked as a make-up day, straight time not to exceed ten (10) hours or forty (40) hours per week. Starting time will be designated by the Employer. When the five (5) day eight (8) hour work week is in effect forty (40) hours per week will constitute a week's work (normal work week being Monday through Friday). In the event the job is down for any reason beyond the control of the Employer, then Saturday may, at the option of the Employer, be worked as a make-up day; at straight time not to exceed eight (8) hours or forty (40) hours per week.

REPLACEMENT PAGE
FRANKLIN COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 126: Means eight (8) hours per day shall constitute a day's work and forty (40) hours per week, Monday through Friday, shall constitute a week's work. The regular starting time shall be 8:00 a.m. If a second or third shift is used, the regular starting time of the second shift shall be 4:30 p.m. and the regular starting period for the third shift shall be 12:30 a.m. These times may be adjusted by the employer. The day shift shall work a regular eight (8) hours shift as outlined above. Employees working a second shift shall receive an additional $0.25 above the regular hourly rate and perform seven and one-half (7½) hours work for eight (8) hours pay. Third shift employees shall be paid an additional $0.50 above the regular hourly rate and work seven (7) hours for eight (8) hours pay. When circumstances warrant, the Employer may change the regular workweek to four (4) ten-hour days at the regular time rate of pay. All time worked before and after the established workday of eight (8) hours, Monday through Friday, and all time worked on Saturday shall be paid at the rate of time and one-half (1½) except in cases where work is part of an employee's regular Friday shift. All time worked on Sunday and recognized holidays shall be paid at the double (2) time rate of pay except in cases where work is part of an employee's previous day's shift. For all overtime hours worked $29.15 of the fringe benefits portion of the prevailing wage shall be paid at the same overtime rate at which the cash portion of the prevailing wage is to be paid. The remaining $1.66 of the fringe benefit portion of the prevailing wage may be paid at straight time.

FRANKLIN COUNTY
BUILDING CONSTRUCTION - HOLIDAY SCHEDULE

NO. 3: All work done on New Year's Day, Decoration Day, July 4th, Labor Day, Veteran's Day, Thanksgiving and Christmas shall be compensated at the double (2) time rate of pay. When any of these holidays fall on a Sunday, the following Monday shall be observed.

NO. 5: All work that shall be done on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day shall be paid twice the amount of his or her regular hourly wage rate for each hour or fraction thereof worked on any such day .

NO. 6: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day and any additional holidays which may be mutually agreed upon. Whenever any such holiday falls on a Sunday, the following Monday shall be recognized and observed as the holiday. Work performed on Sundays and holidays shall be paid at the double time rate of pay. No work shall be performed on Labor Day.

NO. 7: The following days are assigned days and are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. If a holiday falls on a Saturday, it shall be observed on the preceding Friday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week. However, no reimbursement for these eight (8) hours is to be paid to the workman unless worked. If workman are required to work the above enumerated holidays or days observed as such, or on Sunday, they shall receive double (2) the regular rate of pay for such work.

NO. 8: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day, or the days observed in lieu of these holidays, shall be paid at the double time rate of pay.

NO. 12: All work done on New Year's Day, Decoration Day, Independence Day, Veteran's Day, Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. Should any of these days fall on Sunday, then the following day shall be observed as the holiday. Under no circumstances shall employees be permitted to work on Labor Day.

NO. 19: All work done on New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day shall be paid at the double time rate of pay. The employee may take off Friday following Thanksgiving Day. However, the employee shall notify his or her Foreman, General Foreman or Superintendent on the Wednesday preceding Thanksgiving Day. When one of the above holidays falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double (2) time rate. When one of the holidays falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double (2) time rate.

NO. 25: All work done on New Year's Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving, Christmas Day, Presidential Election Day, or days locally observed as such, and Saturday and Sunday shall be recognized as holidays and shall be paid at the double (2) time rate of pay. If a named holiday falls on a Saturday, the holiday will be observed on the preceding Friday. When a named holiday falls on Sunday, the Monday after will be observed as the holiday. Appropriate overtime rates to be based on fifteen minute increments.

NO. 26: All work done on New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. When a Holiday occurs on Saturday it shall not be observed on either the previous Friday or the following Monday. Such days shall be regular work days. If such a holiday occurs on Sunday it shall be observed on the following Monday.

NO. 31: All work done on New Year's Day, Presidents Day, Good Friday, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, and Employee's Birthday shall be paid at the double time rate of pay. If a holiday falls on Sunday, the following Monday will be observed as the recognized holiday. If a holiday falls on Saturday, the preceding Friday will be observed as the recognized holiday.

FRANKLIN COUNTY
BUILDING CONSTRUCTION - HOLIDAY SCHEDULE

NO. 36: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workman unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make-up day when an observed holiday occurs during the work week. Employees have the option to work that make-up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 41: The following days shall be observed as legal holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day. No work shall be performed on the Fourth of July, Labor Day or Christmas Day. Any work performed on the above holidays shall be paid for at two (2) times the regular straight time rate of pay. When any of the above holidays fall on Sunday, the following Monday shall be observed as such holiday. If a holiday falls on Saturday, it shall not be considered to be observed on the previous Friday or following Monday. Such days shall be regular workdays.

NO. 42: The following days shall be observed as legal holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day. No work shall be performed on the Fourth of July, Labor Day or Christmas Day. Any work performed on the above holidays shall be paid for at two (2) times the regular straight time rate of pay. When any of the above holidays fall on Sunday, the Monday following shall be observed as such holiday. If a holiday falls on Saturday, it shall not be considered to be observed on the previous Friday or following Monday. Such days shall be regular workdays.

NO. 45: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving, the day before Christmas, and Christmas Day, shall be paid at the double time rate of pay.

NO. 47: The following holidays are recognized: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving and Christmas Day. When a holiday listed above falls on Saturday, it shall be celebrated on the Friday preceding the holiday. When a holiday falls on Sunday, the following Monday shall be observed. Holidays referred to above shall be paid for at the double (2) time rate of pay when worked.

NO. 51: All time worked on Sundays and recognized holidays shall be paid for at the rate of double (2) the hourly base wage rate in effect. The Employer agrees to recognize the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day. If the holiday falls on Sunday, it shall be recognized on the following Monday. If the holiday falls on a Saturday, it shall be recognized as a Saturday only holiday.

NO. 54: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day shall be paid at the double (2) time rate of pay. When a holiday falls on Saturday, it shall be observed on Friday. When a holiday falls on Sunday, it shall be observed on Monday.

NO. 55: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workmen unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a makeup day when an observed holiday occurs during the work week. Employees have the option to work that make up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

FRANKLIN COUNTY
BUILDING CONSTRUCTION - HOLIDAY SCHEDULE

NO. 60: All work performed on New Year's Day, Armistice Day (Veteran's Day), Decoration Day (Memorial Day), Independence Day (Fourth of July), Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. No work shall be performed on Labor Day except when triple (3) time is paid. When a holiday falls on Saturday, Friday will be observed as the holiday. When a holiday falls on Sunday, the following Monday shall be observed as the holiday.

NO. 66: All work performed on Sundays and the following recognized holidays, or the days observed as such, of New Year's Day, Decoration Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day, shall be paid at double (2) the hourly rate plus an amount equal to the hourly Total Indicated Fringe Benefits. Whenever any such holidays fall on a Sunday, the following Monday shall be observed as a holiday.

NO. 69: All work performed on New Year's Day, Memorial Day, July Fourth, Labor Day, Veteran's Day, Thanksgiving Day or Christmas Day shall be compensated at double (2) their straight-time hourly rate of pay. Friday after Thanksgiving and the day before Christmas are also holidays, however, if the employer chooses to work the normal work hours on these days, the employee will be paid at straight -time rate of pay. If a holiday falls on a Saturday, the holiday will be observed on Saturday; if a holiday falls on a Sunday, the holiday will be observed on the following Monday.

NO. 71: All work performed on the following recognized holidays, or days that may be celebrated as such, shall be paid at the double (2) time rate of pay: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Day after Thanksgiving and Christmas Day. If a holiday falls on Sunday, it shall be celebrated on Monday. If a holiday falls on Saturday, it shall be celebrated on the Friday proceeding such Saturday.

NO. 73: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day (or mutually agreed date of the Friday after Thanksgiving Day may be substituted for Veteran's Day), Thanksgiving Day and Christmas Day, or in the event that any of said Holidays falls on Sunday, then the day or days generally recognized as such. Any work performed anywhere on any of the aforesaid Holidays, or on the day or days recognized and observed as such, shall be paid for at double (2) time the regular hourly rate.

OCCUPATIONAL TITLE	* Date of Increase	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits
Carpenter	6/18	$34.93	23	16	$17.10
Cement Mason	6/18	$31.49	34	22	$18.93
Electrician (Outside-Line Construction\Lineman)		$44.56	9	12	$5.75 + 36%
Lineman Operator		$38.35	9	12	$5.75 + 36%
Lineman - Tree Trimmer	6/18	$25.62	32	31	$11.70 + 3%
Groundman		$29.48	9	12	$5.75 + 36%
Groundman - Tree Trimmer	6/18	$20.30	32	31	$8.88 + 3%
Laborer					
General Laborer	6/18	$31.11	2	4	$13.82
Skilled Laborer	6/18	$31.71	2	4	$13.82
Millwright	6/18	$34.93	23	16	$17.10
Operating Engineer					
Group I	6/18	$32.96	10	9	$27.43
Group II	6/18	$32.96	10	9	$27.43
Group III	6/18	$31.66	10	9	$27.43
Group IV	6/18	$28.20	10	9	$27.43
Oiler-Driver	6/18	$28.66	10	9	$27.43
Pile Driver	6/18	$34.93	23	16	$17.10
Traffic Control Service Driver		$28.775	26	25	$9.045
Truck Driver-Teamster		$30.41	25	21	$10.82

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate sheet.

FRANKLIN COUNTY
HEAVY CONSTRUCTION - OVERTIME SCHEDULE

FED: Minimum requirement per Fair Labor Standards Act means time and one-half (1½) shall be paid for all work in excess of forty (40) hours per work week.

NO. 2: Means a regular workweek shall be forty (40) hours and will start on Monday and end on Friday. The Employer shall have the option of working five 8-hour days or four 10-hour days Monday through Friday. If an Employer elects to work five 8-hour days during any workweek, hours worked more than eight (8) per day or 40 per week shall be paid at time and one-half the hourly rate Monday through Friday. If an Employer elects to work four 10-hour days in a week, work performed more than ten (10) hours per day or 40 hours per week shall be paid at time and one-half the hourly rate Monday through Friday. When working a five 8-hour day schedule and an Employer is prevented from working forty (40) hours Monday through Friday, or any part thereof, by reason of inclement weather, Saturday or any part thereof may be worked as a make-up day at the straight time rate. If an Employer is working a four 10-hour day schedule and loses a day due to inclement weather, he may work 10 hours Friday at straight time. All hours worked over the 40 hours Monday through Friday will be paid at 1 ½ overtime rate. A workday shift is to begin at the option of the Employer, between 6:00 a.m. and not later than 9:00 a.m. However, the project starting time may be advanced or delayed if required. If workmen are required to work the enumerated holidays or days observed as such or Sundays, they shall receive double (2) the regular rate of pay for such work. Overtime shall be computed at one-half (1/2) hour intervals. Shift: The Contractor may elect to work one, two or three shifts on any work. When operating on more than one shift, the shifts shall be known as the day shift, swing shift, and graveyard shift as such terms are recognized in the industry. When two shifts are worked on any operation, the shifts will consist of eight (8) or ten (10) hours exclusive of lunchtime. When three shifts are worked the first day or day shift will consist of eight (8) hours exclusive of lunchtime. The second or swing shift shall consist of seven and one-half (7 1/2) hours work for eight hours pay, exclusive of lunchtime, and the third or the graveyard shift shall consist of seven (7) hours work for eight (8) hours pay, exclusive of the lunchtime. All time in excess of normal shifts shall be considered overtime. Multiple shift (the two or three shift) operation will not be construed on the entire project if at anytime it is deemed advisable and necessary for the Employer to multiple shift a specific operation. However, no shift shall be started between midnight and six a.m. except the graveyard shift on a three-shift operation, or except in an unusual or emergency situation. If an Employer starts a shift between midnight and 6 a.m. except the graveyard shift on a three-shift operation, he shall reimburse all employees for the entire shift at the double time rate. Completion of the second shift on a two-shift operation or completion of the graveyard shift on a three-shift operation that carries over into Saturday morning shall be at the straight time rate. Overtime shall be computed at ½ hour intervals.

NO. 9: Eight (8) hours shall constitute a work day between the hours of 7:00 a.m. and 4:30 p.m. Forty (40) hours within five (5) days, Monday through Friday inclusive, shall constitute the work week. Work performed in the 9th and 10th hour, Monday through Friday, shall be paid at time and one-half (1½) the regular straight time rate of pay. Contractor has the option to pay two (2) hours per day at the time and one-half (1½) the regular straight time rate of pay between the hours of 6:00 a.m. and 5:30 p.m., Monday through Friday. Worked performed in the first eight (8) hours on Saturday shall be paid at the rate of one and eight tenths (1.8) the regular straight time rate. Work performed outside these hours and on Sundays and recognized legal holidays, or days celebrated as such, shall be paid for at the rate of double (2) time.

FRANKLIN COUNTY
HEAVY CONSTRUCTION - OVERTIME SCHEDULE

NO. 10: Means the regular workday for which employees shall be compensated at straight time hourly rate of pay shall, unless otherwise provided for, begin at 8:00 a.m. and end at 4:30 p.m. The regular workweek shall consist of five (5) days, Monday through Friday, beginning at 8:00 a.m. and ending at 4:30 p.m. except as may be modified. The starting time may be either advanced or delayed one hour or two hours at the discretion of the Employer. The Employer may have the option to schedule his work week from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate. If the Employer elects to work Monday through Thursday and is stopped due to inclement weather, holidays or other conditions beyond the control of the Employer, he shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hour workweek. All necessary overtime and work performed on Saturday, shall be paid at time and one-half (1½) the hourly rate, plus an amount equal to one-half (½) of the hourly Total Indicated Fringe Benefits. All work performed on Sundays and recognized holidays shall be paid at double (2) the hourly rate, plus an amount equal to the hourly Total Indicated Fringe Benefits. Shifts may be established when considered necessary by the Employer. Shift hours and rates will be as follows. If shifts are established, work on the First Shift will begin between 6:00 a.m. and 9:00 a.m. and consist of eight (8) hours of work plus one-half hour unpaid lunch. Hours worked during the first shift will be paid at the straight time rate of pay. The second shift shall start eight hours after the start of the first shift and consist of eight (8) hours of work plus one-half hour unpaid lunch. Work on the second shift will begin between 2:00 p.m. and 5:00 p.m. and be paid the straight time rate plus $2.50 per hour. The third shift shall start eight hours after the start of the second shift and consist of eight (8) hours plus one-half hour unpaid lunch. Work on the third shift will begin between 10:00 p.m. and 1:00 a.m. and be paid the straight time rate plus $3.50 per hour. The additional amounts that are to be paid are only applicable when working shifts. Shifts that begin on Saturday morning through those shifts which end on Sunday morning will be paid at time and one-half these rates. Shifts that begin on Sunday morning through those shifts which end on Monday morning will be paid at double time these rates.

NO. 17: Means eight (8) hours shall constitute the regular work day and forty (40) hours a work week, Monday through Friday. The Employer shall establish the starting time between 6:30 a.m. through 9:00 a.m. An Employer may further adjust the starting time up to 9:30 A.M. throughout the year. Time and one-half (1½) shall be paid after eight (8) consecutive hours worked after the established starting time and for hours worked before the established starting time. Time and one-half (1½) shall be paid for work performed on Saturdays. Work performed on Sundays and Holidays shall be paid at the double (2) time rate of pay. The Employer when working on Highway and Road Work may have the option to schedule the work week for his paving crew only from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate of time and one-half (1½). If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), the Employer shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours.

NO. 23: Means the regular workweek shall start on Monday and end on Friday, except where the Employer elects to work Monday through Thursday, (10) hours per day. All work over ten (10) hours in a day or forty (40) hours in a week shall be at the overtime rate of one and one-half (1½) times the regular hourly rate. The regular workday shall be either eight (8) or ten (10) hours. If a job can't work forty (40) hours Monday through Friday because of inclement weather or other conditions beyond the control of the Employer, Friday or Saturday may be worked as a make-up day at straight time (if working 4-10's). Saturday may be worked as a make-up day at straight time (if working 5-8's). An Employer, who is working a four (4) ten (10) hour day work schedule may use Friday as a make-up day when a workday is lost due to a holiday. A workday is to begin at the option of the Employer but not later than 11:00 a.m. except when inclement weather, requirements of the owner or other conditions beyond the reasonable control of the Employer prevent work. Except as worked as a make-up day, time on Saturday shall be worked at one and one-half (1½) times the regular rate. Work performed on Sunday shall be paid at two (2) times the regular rate. Work performed on recognized holidays or days observed as such, shall also be paid at the double (2) time rate of pay. For all overtime hours worked during the week or on Saturday $16.25 of the fringe benefits portion of the prevailing wage shall be paid at time and one-half (1½). For all overtime hours worked on Sundays or recognized holidays $16.25 of the fringe benefits portion of the prevailing wage shall be paid double time. The remaining $.60 of the fringe benefit portion of the prevailing wage shall be paid at straight time.

FRANKLIN COUNTY
HEAVY CONSTRUCTION - OVERTIME SCHEDULE

NO. 25: Means a regular work week of forty (40) hours, starting on Monday and ending on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof maybe worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A work day is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time maybe advanced or delayed if mutually agreed to by the interest parties. All hours worked on recognized holidays, or days observed as such, double (2) time shall be paid.

NO. 26: Means a regular work week of forty (40) hours will start on Monday and end on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof may be worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A workday is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time may be advanced or delayed if mutually agreed to by the interest parties. For all time worked on recognized holidays, or days observed as such, double (2) time shall be paid.

NO. 32: Means the overtime rate shall be time and one-half the regular rate for work over forty (40) hours per week. Sundays and Holidays shall be paid at double the straight time rate.

NO. 34: Means the regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute unpaid lunch period, with pay at the straight time rate. If the workday starts at 8:00 a.m., the quitting time shall be no later than 4:30 p.m. When separate crews are used, the start time may be adjusted from 6:00 AM through 9:00 AM. The start time may be further adjusted to 9:30 AM throughout the year if required by government agency or municipal ordinance. Time and one-half (1½) shall be paid after eight (8) consecutive hours Monday through Saturday. All work performed on Sundays and recognized holidays shall be paid at double (2) the hourly rate. If a crew of another trade working for the employer is receiving overtime pay, the Cement Mason crew shall receive overtime pay. The Employer has the option to schedule the work week from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be paid at the applicable overtime rate. When an Employer schedules 4-10's, the Employer will not bring in any other crew for a fifth workday on the project while not calling in the normal crew that had been scheduled for that project. If the Employer elects to work 4-10's Monday through Thursday and is stopped due to inclement weather, or other conditions beyond the control of the Employer, the Employer shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours for the workweek. Shifts may be established when considered necessary by the employer. Shift hours and rates will be as follows. All shifts shall be eight (8) hours plus one-half (1/2) hour for unpaid lunch. First shift will begin at 8:00 a.m. and end at 4:30 p.m. Hours worked during the first shift will be paid at the straight time rate of pay. The second shift shall start eight hours after the start of the first shift and will be paid the straight time rate plus $2.50 per hour premium. The third shift shall start eight hours after the start of the second shift and will be paid the straight time rate plus $3.50 per hour premium. Shifts will be established for a minimum of three consecutive workdays. If only two shifts are worked, the Employer may regulate the start time to take maximum advantage of daylight hours.

FRANKLIN COUNTY
HEAVY CONSTRUCTION - HOLIDAY SCHEDULE

NO. 4: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, or observed as such, shall be paid at the double time rate of pay. When a Holiday falls on a Sunday, Monday shall be observed. No work shall be performed on Labor Day, except in case of jeopardy to life or property. This is applied to protect Labor Day.

NO. 9: All work performed on Sundays and the following recognized holidays, or the days observed as such, of New Year's Day, Decoration Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day, shall be paid at double (2) the hourly rate plus an amount equal to the hourly Total Indicated Fringe Benefits. Whenever any such holidays fall on a Sunday, the following Monday shall be observed as a holiday.

NO. 12: All work performed on New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, Christmas Day, or days celebrated as such, shall be paid at the double time rate of pay. When one of the foregoing holidays falls on Sunday, it shall be celebrated on the following Monday. When one of the foregoing holidays falls on Saturday, it shall be celebrated on the Friday before the holiday.

NO. 16: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on Sunday, it shall be observed on the following Monday. If a holiday falls on Saturday, it shall be observed on the preceding Friday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid to the worker unless worked. If workers are required to work the above recognized holidays or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 21: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workman unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make-up day when an observed holiday occurs during the work week. Employees have the option to work that make-up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 22: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day and any additional holidays which may be mutually agreed upon. Whenever any such holiday falls on a Sunday, the following Monday shall be recognized and observed as the holiday. Work performed on Sundays and holidays shall be paid at the double time rate of pay. No work shall be performed on Labor Day.

NO. 25: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workmen unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make-up day when an observed holiday occurs during the work week. Employees have the option to work that make up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 31: All work performed on New Year's Day, Presidents' Day, Veterans' Day, Good Friday, Decoration Day, Fourth of July, Labor Day, Christmas Eve Day, Christmas Day, Thanksgiving Day and Day after Thanksgiving or days celebrated for the same.

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

MISSOURI PUBLIC WORKS PROJECTS
PUBLIC BODY CHECK-OFF LIST

The Division of Labor Standards (DLS) is providing this check-off list to assist public entities in being compliant with Missouri's labor laws applicable to public construction projects. The Prevailing Wage Law requires that not less than the prevailing hourly rate of wages be paid to workers on all construction projects over $75,000 total that are for the public use or benefit or that use public funds. Failure to comply with the Prevailing Wage Law may constitute a misdemeanor for the employer and for the public official that does not fulfill the responsibilities it imposes. The Construction Safety Training Act mandates that all employees working on the site of public works construction projects must have received safety training.

I
Before Contract Is Let

- ☐ Before the contract is let, you must submit a Request for Wage Determination form (PW-3) to the DLS to obtain the annual wage order from their website www.labor.mo.gov/DLS/PrevailingWage (Sections 290.250 and 290.325, RSMo).
- ☐ Attach the wage order obtained from DLS, and make it a part of, the specifications for the work to be performed under the contract (Section 290.250 and 290.325, RSMo).
- ☐ Create a contract which incorporates the following:
  - ☐ Insert a statement such as: "**Not less** than the prevailing hourly rate of wages, as set out in the wage order attached to and made part of the specification for work under the contract, **shall** be paid to all workers performing work under the contract." (Section 290.250, RSMo).
  - ☐ Insert a statement such as: "The contractor will forfeit a penalty to the contracting public body of $100 per day (or portion of a day) for each worker that is paid less than the prevailing rate for any work done under the contract by the contractor or by any subcontractor." (Section 290.250, RSMo). For detailed information on rules and occupational titles, see 8 CSR 30-3.010 through 3.060.
  - ☐ Insert a statement such as: "The contractor and all subcontractors to the contract must require all on-site employees to complete the ten-hour construction safety training program required under Section 292.675, RSMo, unless they have previously completed the program and have documentation of having done so."
  - ☐ Insert a statement such as: "The contractor will forfeit a penalty to the contracting public body of $2500 plus an additional $100 for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training." (Section 292.675, RSMo).
- ☐ Before any work begins, you must send a **Prevailing Wage Project Notification – Contractor Information Notification** form (PW-2) to the DLS. Send it when the contract is awarded to ensure the DLS receives it timely (Section 290.262.9, RSMo, and 8 CSR 30-3.010[3]).
- ☐ Verify if a wage subsidy, bid supplement, or rebate was provided, and if so, if it was provided lawfully. The amount and date of such subsidy, supplement or rebate must be reported to the public body within 30 days of receipt of payment (Section 290.095, RSMo).

II
While Contract Is Being Performed

☐ Review records of wages paid to all workers employed on the contract to assure workers are paid properly (Section 290.290, RSMo). Records must be kept within the state by the contractor and each subcontractor for a period of one year following completion of the public works project. DLS provides a Contractor Payroll Records form (LS-57) for contractors and subcontractors to use to assure provision of the payroll information required (8 CSR 30-3.010[7]).

☐ If you are aware of any possible prevailing wage violation, you must report it to the DLS using the **Prevailing Wage Complaint** form (PW-6). A public body cannot make final payment until full compliance with the law has been achieved.

☐ A legible list of all prevailing wage rates **must remain** posted in a prominent and easily accessible place at the worksite by each contractor and subcontractor on the project. **Require** the notice to be posted during the entire time that any worker is employed on the job (Section 290.265, RSMo).

III
Before Contract Is Fully Paid

☐ Before final payment can be made, the general contractor and all subcontractors **must** file an **Affidavit of Compliance** form (PW-4) with the contracting public body. The affidavit must state the party has fully complied with the Missouri Prevailing Wage Law, and the public body must verify that the correct wages were paid. No payment can be legally made by the public body to the contractor(s) until the affidavit is filed in proper form and order with the public body (Section 290.290 and 290.325, RSMo).

☐ It shall be the duty of such public body awarding the contract, and its agents and officers, to take cognizance of all complaints of all violations of the provisions of section 290.210 to 290.340 committed in the course of the execution of the contract, and, when making payments to the contractor becoming due under the contract, to withhold and retain therefrom all sums and amounts due and owing as a result of any violation of section 290.210 to 290.340 (Section 290.250.1, RSMo).

Failure to comply with the requirements of the Prevailing Wage Law can result in civil action, including an injunction stopping work on a project, and in criminal fines of up to $500 and up to six months imprisonment for **each day** there is a violation.

Missouri Department of Labor and Industrial Relations
Division of Labor Standards
Prevailing Wage Section
P.O. Box 449
Jefferson City, MO 65102-0449
Phone: 573-751-3403
Fax: 573-751-3721

Email: prevailingwage@labor.mo.gov

Website: www.labor.mo.gov/DLS/prevailingwage/

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 711

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

MISSOURI PUBLIC WORKS PROJECTS CONTRACTOR CHECK-OFF LIST

The Division of Labor Standards (DLS) is providing this check-off list to assist contractors in being compliant with Missouri's labor laws applicable to public construction projects. The Prevailing Wage Law requires that not less than the locally prevailing wages be paid to workers on every construction project in the state that is for the public use or benefit or that uses public funds. Failure to comply with the Prevailing Wage Law may constitute a misdemeanor for the employer and for the public official that does not fulfill the responsibilities it imposes. The Construction Safety Training Act mandates that all employees working on the site of public works construction projects must have received safety training.

I
Before Contract Is Let

☐ The annual wage order obtained from the DLS website (www.labor.mo.gov/DLS/PrevailingWage) must be made a part of the specifications for the work to be performed under the contract (Section 290.250 and 290.325, RSMo).

II
While Contract Is Being Performed

☐ All workers performing work under a public construction contract must be paid not less than the prevailing hourly rate of wages (as set out in the annual wage order attached to and made part of the specification for work under the contract). (Section 290.250, RSMo).

The contractor will forfeit a penalty to the contracting public body of $100 per day (or portion of a day) for each worker that is paid less than the prevailing rate for any work done under the contract by the contractor or by any subcontractor (Section 290.250, RSMo). For detailed information on rules and occupational titles, see 8 CSR 30-3.010 through 3.060.

☐ The contractor and all subcontractors to the contract must require all on-site employees to complete the ten-hour construction safety training program required under Section 292.675, RSMo, if they have not previously completed the program and have documentation of having done so.

The contractor will forfeit a penalty to the contracting public body of $2500 plus an additional $100 for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training. (Section 292.675, RSMo).

☐ A legible list of all prevailing wage rates **must remain posted** in a prominent and easily accessible place at the worksite by each contractor and subcontractor on the project. The notice must be posted during the full time that any worker is employed on the job (Section 290.265, RSMo).

☐ The payroll records required to be so kept shall be open to inspection by any authorized representative of the contracting public body or of DLS at any reasonable time and as often as may be necessary and such records shall not be destroyed or removed from the state for the period of one year following the completion of the public work in connection with which the records are made (Section 290.290, RSMo). DLS provides a Contractor Payroll Records form (LS-57) for contractors and subcontractors to use to assure provision of the payroll information required (8 CSR 30-3.010[7]).

III
Before Contract Is Fully Paid

☐ Before final payment can be made, the general contractor and all subcontractors **must** file an **Affidavit of Compliance** (PW-4) with the contracting public body. The affidavit must affirm under oath that the party has fully complied with Missouri Prevailing Wage Law, and the public body must verify that the correct wages were paid. No payment can be legally made by the public body to the contractor(s) until the affidavit is filed in proper form and order with the public body (Section 290.290 and 290.325, RSMo).

☐ It shall be lawful for any contractor to withhold from any subcontractor under him sufficient sums to cover any penalties withheld from him by the awarding body on account of any such subcontractor's failure to comply with the terms of sections 290.210 to 290.340, and if payment has already been made to him, the contractor may recover from the subcontractor the amount of the penalty in a suit at law (Section 290.250.1, RSMo).

Failure to comply with the requirements of the Prevailing Wage Law can result in civil action, including an injunction stopping work on a project, and in criminal fines of up to $500 and up to six months imprisonment for **each day** there is a violation.

Missouri Department of Labor and Industrial Relations
Division of Labor Standards
Prevailing Wage Section
P.O. Box 449
Jefferson City, MO 65102-0449
Phone: 573-751-3403
Fax: 573-751-3721

Email: prevailingwage@labor.mo.gov

Website: www.labor.mo.gov/DLS/prevailingwage/

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 71

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

PREVAILING WAGE PROJECT NOTIFICATION – CONTRACTOR INFORMATION

☐ New ☐ Update

The information below is requested pursuant to Sections 290.210 through 290.340, RSMo.

1. Date of Notification	2. Annual Wage Order Number Included in Bid Specifications
3. Popular or Descriptive Name of Project	
4. Estimated Project Cost of Completion *(total construction contracts to be awarded)* $	
5. Exact Location of Project County City	
6. Official Name of Public Body or Agency	
7. Name of Contact Person	8. Phone Number *(include area code)*
9. Address	
10. Email Address Website	

11. Contract Award Date	12. Estimated Date of Project Completion	13. Will There Be Any Federal Funds Used in this Contract? ☐ Yes ☐ No

14. Contractor Information Notification

General Contractor:

Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

List all Subcontractors:

1. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

2. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

3. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

(Subcontractors continued)

4. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

5. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

6. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

7. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

8. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

9. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

The state of Missouri requires workers on public works projects be paid the prevailing wage. Public bodies have duties as required under Section 290.210 - 290.340, RSMo.

Mail, Fax, or Email completed form to:

DIVISION OF LABOR STANDARDS
Attn: Prevailing Wage Section
P.O. Box 449, Jefferson City, MO 65102-0449
Phone: 573-751-3403 Fax: 573-751-3721
Email: prevailingwage@labor.mo.gov
Website: www.labor.mo.gov/DLS

SUBMIT

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 711

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

AFFIDAVIT
COMPLIANCE WITH THE PREVAILING WAGE LAW

I, _____, upon being duly sworn upon my oath state that: (1) I am the
(Name)

_____ of _____; (2) all requirements of
(Title) *(Name of Company)*

§§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects have been fully satisfied with regard to this company's work on _____;
(Name of Project)

(3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this company's work on this project; and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. _____ Section _____ issued by the Missouri Division of Labor Standards and applicable to this project located in _____ County, Missouri, and completed on the ____ day of _____, _____.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

_____
Signature

Subscribed and sworn to me this ____ day of _____, _____.

My commission expires _____, _____.

_____
Notary Public

_____
Receipt by Authorized Public Representative

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

CONTRACTOR PAYROLL RECORDS

(See Sections 290.210 to 290.340, RSMo and 8 CSR 30-3.010 to 8 CSR 30-3.060)

Name of ☐ Contractor ☐ Subcontractor	Address of Contractor or Subcontractor: City: State: ZIP: Phone Number: ( ) -
Name of Public Body	Address of Public Body: City: State: ZIP: Phone Number: ( ) -

Payroll No.	For Week Ending / /	AWO	Project and Location	Project or Contract No.

1. Name and Address of Employee	2. Occupational Title ***	3. Day and Date							4. Total Hours	5. Hourly Rate	6. Gross Amt Project / Week	7. Deductions					8. Net Wages Paid for Week
		Day										FICA and Medicare	Federal and State Withholding Tax	Other A	Other B	Total Deductions	
		Date															
		Hours Worked Each Day															
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								
		DT							0							0	
		OT							0								
		ST							0								

****** If a worker performs work in more than one occupational title, you must separately list the hours worked per occupational title and wage rates. ******

FRINGE BENEFITS

In addition to the basic rates paid to each laborer or mechanic on the payroll, payments have been or will be made to appropriate programs for the benefit of these employees as shown in the following chart below. If fringe benefit amounts paid are the same for all employees, you may list the amount of each such identical fringe payment only once in the appropriate column; if the fringe benefit amounts vary by employee, list each employee's name and set out the amounts paid on behalf of each employee for each fringe benefit.

Employee Name	Health and Welfare ($/hr)	Pension ($/hr)	Vacation ($/hr)	Holiday ($/hr)	Appren-tice Training ($/hr)	Other C ($/hr)	Other D ($/hr)	Total ($/hr)	If "Other/Deduction" or Fringes, please explain. (Indicate Other A, B, C or D)	Identify by name, the plan, fund, or programs to which fringe benefits are paid. (Indicate H&W, Pension, etc.)
								0		
								0		
								0		
								0		
								0		
								0		
								0		
								0		

Date: _____

I, _____ *(Name of Signatory Party)*, _____ *(Title)* do hereby state:

(1) That I pay or supervise the payment of the persons employed by _____ *(Contractor or Subcontractor)* on the _____ *(Building or Work)*; that during the payroll period commencing seven (7) days prior to the week ending date of _____ all persons employed on said project have been paid the full weekly wages stated above, that no rebates have been or will be made either directly or indirectly to or on behalf of _____ *(Contractor or Subcontractor)*, from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than legally permissible deductions, that full and accurate records clearly indicating the names, occupations, and crafts of every worker employed by them in connection with the public work together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed and deduction made for each worker have been prepared, that these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available as often as may be necessary and such records shall not be destroyed or removed from the state for the period of one year following the completion of the public work in connection with which the records are made.

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage order incorporated into the contract; that the occupational title set forth herein for each laborer or mechanic conform with the work performed.

Name and Title	Signature
The falsification of any of the above statements may subject the contractor or subcontractor to criminal prosecution. See Sections 290.340, 570.090, 575.050, and 575.060, RSMo.	

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 711

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

CONTRACTOR'S WAGE SURVEY

PROJECT INFORMATION

Contractor's Name, Address, and Telephone Number

Please Select One:

☐ Collective Bargaining Agreement Rate

☐ Non-Collective Bargaining Agreement Rate

County _____

Dates of Work Reported Below

Beginning ____/____/____ Ending ____/____/____

Description _____

Type of Construction: ☐ Building ☐ Heavy and Highway

E-mail _____ Website _____

Occupational Title(s)	No. of Employees	Total Hours	Basic Hourly Rate	Hourly Fringe Benefits Payments						
				H & W	Pension	Vacation	App. Tr.	Suppl.	Holiday	Other

The Contractor's Wage Survey must be submitted to the Division of Labor Standards by January 31.

Certification

To the best of my knowledge, information and belief, I hereby certify that the number of hours, basic hourly rate, and fringe benefit payments listed above are true and correct and that the type of work performed by the number of employees identified above, relative to the Occupational Title(s) reported, is consistent with 8 CSR 30-3.060. I further recognize that any false statement or declaration made herein is punishable under Section 290.340, 570.090, 575.050, and 575.060, RSMo.

_____ Date _____

(Please check appropriate box)

☐ Signature of Contractor's Representative Who Prepared This Report

☐ Signature of Preparer of This Report

Printed Name _____

Title _____

Mail or fax completed form to:
Missouri Department of Labor and Industrial Relations
DIVISION OF LABOR STANDARDS
Attn: Prevailing Wage Section
P.O. Box 449
Jefferson City, MO 65102-0449

Contact Information:
Phone: 573-751-3403
Fax: 573-751-3721
E-mail: prevailingwage@labor.mo.gov
Website: www.labor.mo.gov/DLS

The Division of Labor Standards requests your participation in our Prevailing Wage Survey. Surveys are conducted throughout the year to determine the prevailing wages paid to construction workers in all Missouri counties and the city of St. Louis. Your responses to this survey are your opportunity to participate in establishing the state's prevailing wages.

Please complete the survey form on the other side according to the instructions given below. Complete all spaces on the form or indicate "N/A" for not available where appropriate. You must complete the Project Information entirely for your survey to be accepted.

1) Indicate the dates when the work was performed.
2) Indicate whether the work performed was paid at a Collective Bargaining Agreement Rate or a Non-Collective Bargaining Agreement Rate.
3) Indicate the type of construction (See 8 CSR 30-3.040)
   - BUILDING – sheltered enclosure with walk-in access for the purpose of housing persons, machinery, equipment or supplies.
   - HEAVY AND HIGHWAY – antenna towers, channels, levees, pipe lines, sewers, etc.

   Hours worked on residential construction (single family homes or apartment buildings of less than four stories) and general maintenance should not be reported on this survey. Accordingly, wage data for ALL commercial construction SHOULD be reported.
4) Provide the project information for each project you are reporting. If you require additional forms, visit www.labor.mo.gov/DLS/forms/LS-04-AI.pdf.
5) Please report only wages and fringe benefits paid for actual hours worked. We cannot accept wage information that is estimated or averaged.
6) Indicate the total number of employees and their hours worked in each occupational title. This must be consistent with the occupational titles identified in 8 CSR 30-3.060 (i.e., carpenter, plumber, electrician (inside wireman), operating engineer Group I, etc.). Multiple hourly rates paid to workers require a separate line for each occupational title and rate.

   Wage rates should be reported only for journeyman workers. Do not include wages paid to apprentice workers. Supervisors that are working foremen (those working with the tools) may be reported at the journeyman rate for the hours that they are working with the tools, but only if they are receiving wages higher than the journeyman rate.
7) In the space provided, include the printed name, title, and signature of the person preparing this report.

Thank you for participating in this wage survey. We encourage you to continue to participate by periodically submitting additional reports. If you have any questions or suggestions, please contact us at 573-751-3403 or prevailingwage@labor.mo.gov.

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 711

DRAFT

AIA® Document C106™ – 2013

Digital Data Licensing Agreement

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Party transmitting Digital Data ("Transmitting Party"):
(Name, address and contact information, including electronic addresses)

«HTK Architects, P.A.»
«9300 W. 110th St. Ste 150
Overland Park, KS 66210»
«Telephone Number: (913) 663-5373»
« »
« »

and the Party receiving the Digital Data ("Receiving Party"):
(Name, address and contact information, including electronic addresses)

« »
« »
« »
« »
« »

for the following Project:
(Name and location or address)

«Union R-XI New Elementary School»
« »

The Transmitting Party and Receiving Party agree as follows.

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 TRANSMISSION OF DIGITAL DATA

3 LICENSE CONDITIONS

4 LICENSING FEE OR OTHER COMPENSATION

5 DIGITAL DATA

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data on the Project, and to set forth the license terms.

§ 1.2 This Agreement is the entire and integrated agreement between the parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the parties.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

AIA Document C106™ – 2013. Copyright © 2007 and 2013 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This draft was produced by AIA software at 09:00:20 ET on 12/27/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA39)

§ 1.3 For purposes of this Agreement, the term Digital Data is defined to include only those items identified in Article 5 below.

§ 1.3.1 Confidential Digital Data is defined as Digital Data containing confidential or business proprietary information that the Transmitting Party designates and clearly marks as "confidential."

ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data identified in Article 5 solely and exclusively to perform services for, or construction of, the Project in accordance with the terms and conditions set forth in this Agreement.

§ 2.2 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data, or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.3 If the Transmitting Party transmits Confidential Digital Data, the transmission of such Confidential Digital Data constitutes a warranty to the Receiving Party that the Transmitting Party is authorized to transmit the Confidential Digital Data. If the Receiving Party receives Confidential Digital Data, the Receiving Party shall keep the Confidential Digital Data strictly confidential and shall not disclose it to any other person or entity except as set forth in Section 2.3.1.

§ 2.3.1 The Receiving Party may disclose the Confidential Digital Data as required by law or court order, including a subpoena or other form of compulsory legal process issued by a court or governmental entity. The Receiving Party may also disclose the Confidential Digital Data to its employees, consultants or contractors in order to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Confidential Digital Data as set forth in this Agreement.

§ 2.4 The Transmitting Party retains its rights in the Digital Data. By transmitting the Digital Data, the Transmitting Party does not grant to the Receiving Party an assignment of those rights; nor does the Transmitting Party convey to the Receiving Party any right in the software used to generate the Digital Data.

§ 2.5 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

ARTICLE 3 LICENSE CONDITIONS

The parties agree to the following conditions on the limited license granted in Section 2.1:
(State below rights or restrictions applicable to the Receiving Party's use of the Digital Data, requirements for data format, transmission method or other conditions on data to be transmitted.)

Electronic data of the **(Insert Media)** only are hereby furnished to Recipient for Recipient's convenience and use in providing equipment or material for the referenced project only. By accepting and using this electronic media, Recipient agrees to the following terms and conditions for itself, its heirs, successors, assigns, insurers and all those claiming by, through or under it:

All data contained on this electronic media are instruments of professional service and shall remain the property of Horst, Terrill and Karst Architects, P.A and our Project consultants.As such, this data is intended for Recipient's use only in reference to this specific Project. Any other use or reuse, or transfer to other parties, is prohibited without written permission of Horst, Terrill and Karst Architects, P.A.

The information contained on this electronic media is provided as a convenience to Recipient and is furnished in "as is" condition.The official contract documents issued for the project are printed hard copy drawings, specifications, addenda and other contract documents. Modifications may have been made to the hard copy contract documents that do not appear on the electronic media. Recipient is solely responsible for confirming and correlating the accuracy and completeness of the electronic data to be consistent with the hard copy contract documents. It is further

AIA Document C106™ – 2013. Copyright © 2007 and 2013 by The American Institute of Architects. **All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This draft was produced by AIA software at 09:00:20 ET on 12/27/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA39)

understood that the official hard copy contract documents are not guaranteed as to accuracy or completeness. Discrepancies or conflicts within the official contract documents are to be resolved in accordance with applicable terms of the contract documents, and neither Horst, Terrill and Karst Architects, P.A. nor the Owner are to be responsible for resolution of discrepancies or conflicts in any other manner.

By accepting and using this electronic media, Recipient agrees to be bound by the foregoing terms and conditions, and further, to indemnify, defend and hold harmless Horst, Terrill and Karst Architects, P.A., Project Engineers and the Owner, together with their respective officers, owners, board members, employees, insurers and consultants from any claims, suits liabilities, damages losses or costs arising from Recipient's use of same.

ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:
(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)

« »

ARTICLE 5 DIGITAL DATA

The Parties agree that the following items constitute the Digital Data subject to the license granted in Section 2.1:
(Identify below, in detail, the information created or stored in digital form the parties intend to be subject to this Agreement.)

« »

This Agreement is entered into as of the day and year first written above and will terminate upon Substantial Completion of the Project, as that term is defined in AIA Document A201™–2007, General Conditions of the Contract for Construction, unless otherwise agreed by the parties and set forth below.
(Indicate when this Agreement will terminate, if other than the date of Substantial Completion.)

««»

« »	« »
TRANSMITTING PARTY *(Signature)*	**RECEIVING PARTY** *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

AIA Document C106™ – 2013. Copyright © 2007 and 2013 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This draft was produced by AIA software at 09:00:20 ET on 12/27/2018 under Order No. 3126404119 which expires on 03/21/2019, and is not for resale.
User Notes: (3B9ADA39)

Knowledge for Creating and Sustaining the Built Environment

FORM 1.5C SUBSTITUTION REQUEST

(During the Bidding/Negotiating Stage)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ _____ Phone: _____

Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

Attach to E-Mail | Print a Copy | Save a Copy | Attach a file | Reset Form

© Copyright 2007, Construction Specifications Institute, 99 Canal Center Plaza, Suite 300, Alexandria, VA 22314

Union R-XI School District
Middle School
Scope of Work
Bid Package No. 1 - General Works Contractor

`

The Owner Representative (OR) referred to below is Navigate Building Solutions, LLC. The Owner referred to below is the **UNION R-XI SCHOOL DISTRICT.** The Contractor referred to below is the General Works Contractor. This bid package includes, but is not limited to, the following:
All work outlined by the project documents (plans and specifications) issued by HTK Architects dated February 12, 2019.

Specifications: Division 00 all Sections; Division 01 all Sections; Division 03 through 28 all Sections; Division 31 through 33 all Sections; Civil & Landscaping work.

1. Contractor is aware of the potential for Liquidated Damages. Contractor shall be responsible to maintain scheduled items for the Contractor's work as included in the project master schedule below. Contractor shall reference AIA 101 and AIA 201 contract drafts provided in the bid documents (to be issued in Bid Addenda), Contractor agrees to pay the Owner, or to deduct from the Contract Sum, not as a penalty, but as liquidated damages, the amounts listed in the contract drafts provided.

2. The draft AIA 101 and AIA 201 have been modified from their original versions. Contractor shall read and agree to these documents as part of the bid process.

3. Upon execution of this contract, this contractor must submit to the OR a detailed critical path baseline construction schedule outlining each construction activity and phase. This schedule must fall within the master project schedule outlined below and be submitted no later than twenty-one (21) days following execution of the contract. Contractor is required to provide updated work schedules on a weekly basis. Contractor's detailed activity schedule/critical path schedule shall adhere to the master project schedule. Should the Contractor fall behind schedule by more than 5 work days due to the fault of this Contractor, the Contractor shall provide a recovery schedule to the Owner Representative within 5 days of request by the Owner Representative.

Project Master Schedule/Milestone Dates:	
Receipt of Bids	March 12, 2019 at 2:00pm
Supplemental Bid Documents Due	March 13, 2019 at 2:00pm
Pre-Award Interviews	March 15, 2019 time TBD
Board Approval of Contractor	April 17, 2019
Notice to Proceed (Day 1)	April 18, 2019
Mobilization	August 1, 2019
Groundbreaking	TBD
School Summer Break	May 23, 2019 – Aug 15, 2019
General Works Contractor Internal Pre-Punch	March 20, 2020
Substantial Completion/Punchlist Populated (Day 246)	April 3, 2020
All Life Safety Inspections, Occupancy Inspection to be completed on or before	April 3, 2020.
Completion of Punchlist	May 1, 2020
Owner Move-In	May 4, 2020

4. Provide all supervision, labor, tools, equipment and materials to complete the work.

5. Perform all freight, unloading, loading, distribution and hoisting of materials.

6. Furnish, install, maintain and remove temporary on-site trailers and storage containers as required to perform the work. This contractor shall provide in the jobsite trailer a conference table and chairs for contractor weekly foreman meetings, bi-weekly Owner meetings, and other meetings as needed.

7. Perform all work in accordance with OSHA standards and the Additional Project Safety Requirements issued in the specifications (including OSHA 10-hour requirement).

8. The Owner will furnish a land disturbance permit, building permit, fire permit, and County Health Department permit. This contractor (or its subcontractors) is responsible for all other trade permits, tap/connection fees required by utility companies, state, county, local, regional, and federal authorities and agencies associated with this scope of work. Contractor shall also include the cost of the meters from the governing utility companies.

9. Coordinate all work with the Owner Representative.

10. This contractor shall provide all layout required to complete the work included in this Contractor's scope of work.

11. Review all drawings and specifications and accept responsibility for requirements, general notes, notes, specifications, and details as they relate to this scope of work.

12. This Contractor will install, maintain, and remove all SWPPP procedures and silt fence for the project. Contractor will provide weekly and rain event SWPPP reports per MDNR standards.

13. All erosion control systems are inspected and corrected weekly, especially within 48 hours of any rainstorm resulting in one-half inch of rain or more. Any silt or debris leaving the site and affecting public rights-of-ways or storm water drainage facilities shall be cleaned up within 24 hours after the end of the storm. A SWPPP map/plan needs to be posted in the trailer and marked up as BMP's are installed/modified.

14. This Contractor is responsible for locating all public and private utilities.

15. Provide street cleaning to remove dirt, mud, and debris generated by the project site as needed to maintain a clean surface along existing roads and parking lots.

16. Provide adequate dust control during construction work, including misting during demo and earthwork operations.

17. Provide barricades, signage, flagging and flagman for traffic control and public safety during the execution of the work. Coordination of all road closures (full or partial) with OR and city officials.

18. Protect adjacent properties and utilities as required during the execution of this work. Provide shoring or underpinning as required for safe excavations to meet OSHA requirements and to protect adjacent streets, sidewalks and utilities. If this requires engineered shoring systems, this Contractor will provide as needed for this scope of work.

19. This Contractor shall furnish all dumpsters for the project and shall include cost to haul offsite and legally dispose of all construction rubbish and debris. Cleanup all rubbish and debris from site and building daily.

20. Bi-weekly meetings at the jobsite will be held with the Owner Representative. This contractor's Project Manager and Superintendent to coordinate installation of all systems. The work of this contractor must be performed in accordance with the decision and schedules formulated at these meetings so as not to delay the work. The Contractor's Project Manager and Foreman/Superintendent must be present at these meetings.

21. A heavy construction cleaning shall be performed prior to punchlist creation so all surfaces can be observed by the design team. Provide final cleaning of all buildings and site prior to occupancy.

22. Weekly meetings at the jobsite MUST be held with this contractor and its subcontractor's Foreman/Project Managers to coordinate installation of all systems. The Owner and the OR shall be invited to all of these meetings and will attend at their discretion. This contractor shall keep minutes of these meetings and forward to the OR for review weekly.

23. This contractor will be responsible to review all specifications and drawings including Architectural, Civil, Mechanical, Plumbing Electrical, Fire Protection, Low Voltage, and Structural, etc. and will include all divisions of work in their proposal.

24. Contractor will provide ice, cups and distribute drinking water for the jobsite.

25. Provide temporary protection labor and material. Contractor to also install adequate temporary protection across any exposed concrete floors to eliminate staining or damage to finished floor product. Contractor to maintain this until all this contractor's work is complete along with MEPFP trades. Once all the work has been completed this contractor will remove and dispose of the temporary protection (at a minimum request use of masonite boards with the seams taped). Any damage to exposed floors that requires remediation prior to installation of finished surface will be at the expense and responsibility of this Contractor. This includes providing temporary entrances from adjacent existing structures and any necessary temporary construction partitions during renovation phases of work to barricade construction area and occupied spaces. Location of walls/entrances to be coordinated with the Owner & OR.

26. The Owner, Architect, and OR will be very stringent on the quality of exposed concrete floors during punch list. It is ultimately in this contractor's scope of work to protect all finish products through education, signage, and temporary protection.

27. No lignite to be used in any flatwork concrete (interior and exterior).

28. Contractor to furnish first aid and safety supplies as needed. Contractor is solely responsible for site/project safety.

29. Contractor to maintain proper SDS sheets for all materials utilized by this Contractor (and its subcontractors) in a central location on site per OSHA standards. Site Specific Safety Plan shall be completed and kept in the job trailer at all times.

30. Contractor to grout fill frames per architectural details and notes.

31. Provide code compliant seismic support and bracing as required for installation of acoustical ceiling systems and MEPFP systems.

32. Provide Fire-Stop Systems as required for the installation of the work of this project. Fire-Stop Systems for floor and wall penetrations of all Mechanical, Plumbing, Electric and Fire Protection Systems must be included as well.

33. Include cost to furnish and install toilet accessories as indicated. See project documents for clarification of what is OFCI, OFOI, or CFCI.

34. Include wall blocking as needed for ALL toilet accessories regardless of OFCI, OFOI, or CFCI status.

35. Contractor will provide temporary construction toilets for the project.

36. Contractor to provide and maintain weather protection for material and work as required by the project schedule. Contractor to also provide any cold or hot weather measures for weather sensitive materials like concrete, masonry, roofing materials, air/vapor barrier, etc. Delays will not be awarded for construction activities impacted by hot/cold temperatures.

37. Once the framing of the building is complete, this contractor is responsible for securing the building with temporary or permanent measures at the close of every day. Any temporary openings in existing walls are to be secured at all times at the end of the work day.

38. This contractor to supply and install a temporary site fence and appropriate gates at the entrance to the site to ensure that the site is secured daily. At the construction trailers, temporary rock parking is required for visitors to the site, temporary construction parking, staging, and laydown areas. Coordination of all staging/trailer placement/access to be coordinated and approved by the Owner..

39. CONTRACTOR will be required and install/maintain a construction entrance/road. All construction traffic, deliveries, staging, etc. will be required to use this entrance. The gate at the entrance needs to be set far enough off the road that a semi-truck and trailer waiting for the gate to open will not block the public road. All deliveries will need to be coordinated around morning drop off and afternoon release times of the school during the school year.

40. Contractor responsible for any coordination of staging or relocation for materials after initial unloading.

41. Contractor to coordinate all deliveries of materials with Owner Representative's personnel.

42. This contractor to broom clean all floors at least once a week to ensure housekeeping stays up to par.

43. As-built Surveys will be required by this contractor at the Completion of the Project, including for Site Utilities, rain gardens, detention basins, etc. to submit to Utility company or City/County for final approval.

44. Testing shall be performed by and paid for by Owner. The Owner Representative will coordinate testing/inspections as needed to maintain the schedule. Contractor will assist and coordinate/schedule with the agency to perform onsite testing work as needed/required by the documents. If the agency must re-test or re-inspect for failed tests/inspections or if the Contractor fails to notify the testing agency of a cancelled test/inspection, this Contractor shall compensate the Owner for such tests.

45. Include ALL caulking and sealants for all systems and materials furnished and installed.

46. No tobacco use is allowed on the project.

47. Contractor must not burn in the concrete at the carpet tile, vinyl, or other resilient flooring locations. Contractor to ensure floors are kept dry and clean so that the concrete can dry in order to accept adhesive for flooring products. Include moisture mitigation as required by the specifications.

48. This Contractor to supply and install all site storm piping and downspout connections. Contractor to coordinate site, plumbing, and architectural drawings.

49. This Contractor to supply and install all site utilities indicated as new on the project documents. The contractor is responsible for all meter costs as a part of the project.

50. Full-time onsite superintendent is required when any of this Contractor's labor or this Contractor's subcontractors labor is onsite.

51. Provide a mockup of the building envelope materials and construction techniques. The mockup should reflect the project document details and be installed exactly as indicated on the drawings. The purpose of the mockup is to not only review and achieve an approval of the materials, but also to ensure the transition of the materials results in a good water tight condition. Contractor to follow the mockup guidelines outlined in the project documents and must include at least one window (can be a smaller scale), a roof edge condition, all dissimilar material connections at the building envelope, and all flashing details at the building envelope. If, the contractor questions a detail provided, it should be submitted as an RFI and discussed with the project team prior to the construction of the mockup. If no mockup detail is provided in the bid documents, Contractor shall assume that it should be a minimum 8' x 8' full wall section (including but not limited to, footing, stud framing, sheathing, air/vapor barrier, insulation, flashings, waterproofing, all exterior materials, transitions, windows, joint sealants, etc.) with all exterior wall conditions. Contractor to submit proposed detail for approval.

52. This contractor shall produce a submittal log at the beginning of the project that is populated with all of the required submittals for the project and assign due dates for submission to the Architect and due dates for return from the Architect. This log must be submitted to the OR and Architect for review on a weekly basis.

53. This contractor shall maintain a RFI log for the project indicating the following. This log must be submitted to the OR and Architect for review on a weekly basis.

    a. Topic of RFI
    b. Date submitted
    c. Date requested response by
    d. Date returned
    e. Status- Open or Closed

54. Immediately upon award this contractor shall submit a proposed site logistics plan for review. The Owner, OR, contractor, and Architect will meet to review and discuss site logistics and finalize an agreed upon plan of action for construction parking, office/storage containers, temporary toilets, temporary site fence, etc.

55. This contractor must prepare and make available upon request, a procurement log for all long lead materials and equipment. Procurement log must include date of order, date of confirmation of order, expected delivery date, actual delivery date, and comments noting any changes to dates and reasons for change.

56. This contractor shall organize and arrange for pre-installation meetings for all major scopes of work with the subcontractors and manufacturers prior to commencement of those activities and invite the Owner, Architect, and OR to all pre-installation meetings. This contractor shall keep minutes of those meetings and forward to the OR and Architect for review.

57. This contractor will be responsible for submitting daily logs containing the number of workers, equipment, work accomplished, daily weather, deliveries, visitors to the site, any inspections passed or failed, problems encountered, and other relevant data as may be required. Daily logs are required to have a minimum of 6 pictures attached each day. These reports must be emailed to the OR daily utilizing an Apple iPad app called Construction Superintendent and issued to the Owner Representative within 24 hours of work performance.

58. OR must be contacted prior to cover-up of all rough-in so that photographs can be taken for Owner's record if desired.

59. This contractor shall arrange, schedule, organize and video tape all equipment start-ups and Owner Training sessions. The camera requirements should include at minimum a SDR camera with external microphone and tripod. Equipment manufacturer reps should be present at start-ups and trainings and Owner and OR should be notified of all training sessions. At the completion of the Owner Training sessions, this Contractor will organize the videos neatly into chapters and provide (3) copies to the Owner in the form of DVD. It is recommended that this service be contracted with a professional videographer.

60. This contractor must populate a closeout log and submit to the OR and Architect for review to verify that all required items have been populated. Once approved, this log will be used to track required closeout items prior to final payment. This contractor is highly encouraged to submit O&M requirements as soon as possible in advance of final acceptance to help eliminate delay in payment.

61. If this contractor chooses to backfill foundation walls prior to that time which is approved/allowed by the structural engineer, this contractor is responsible for designing, installing, rental (and eventual removal) of all temporary shoring of foundation walls prior to backfill (i.e.: if walls are not designed as structural retaining walls; verify with design engineer).

62. This contractor is responsible for any temporary heating/cooling, humidifying/dehumidifying as needed to maintain the project schedule and as needed prior to starting the permanent HVAC equipment. Use of the new HVAC system will not be allowed during construction.

63. This Contractor shall be responsible for the cost of temporary utilities during the course of construction i.e. but not limited to: gas, electric, sewer, water. If there is only single phase electric available from the local electric utility for temporary electric, any other needs will require the use of a temporary generator at the contractor's cost.

64. This contractor will compile for the Owner a 'record set' of all documents and drawings for the project at substantial completion. This shall be 'red-lined' copies of all project changes throughout the course

of the project to identify all systems as they were actually installed on the project for the Owner's records. These must be electronically recorded and submitted to the Owner in pdf format on a 'thumb drive'.

65. Contractor is required to hold their alternate pricing that was included in the bid form for 3 months after the bid date. Contractor will notify Owner Representative when decisions need to be made regarding the acceptance of bid alternates in order to maintain deliveries, installation, and the master project schedule.

66. Construction work shall only be allowed during the following hours:
    6AM – 6PM (Monday thru Saturday) Anytime outside these hours needs to be pre-approved by the City of Union.

67. Stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

68. The CONTRACTOR shall provide one project signs. The sign will include the Owner's logo, design team logos, owner rep logo and the CONTRACTOR logo. Shall also include the project name and expected completion timeframe. No other project signs will be allowed on the project for advertisement. The sign needs to a minimum of 4' by 8' each. The sign will be installed off the main roads and maintained throughout the project. Location to be approved by the District.

69. The CONTRACTOR will be required to use the Pro Core software for project management. All submittals/RFI's/CO's will be submitted through this software. The project documents (including schedule, meeting minutes, etc.) will also need to be loaded on to this software. The cost for Pro Core software will be the responsibility of the contractor.

70. During the warranty period of the project, this Contractor shall document, maintain and update a Warranty Log of all warranty items, weekly, to be shared with the Client and Owner Representative.

71. Any contractor/employee that will be on the jobsite will be required to pass a background check before beginning work. The background will require the employee to visit the Union R-XI administration offices at 1 Wildcat Drive, Union, MO. They will need a valid driver's license. The administration office will scan the license and issue a badge after passing the background check. The background check looks for sex offenders or any restrictions regarding being within any distance from school grounds.

72. Builder's Risk to be carried by the Owner.

73. Contractor is required to maintain access to the work as needed to maintain schedule. Schedule delays will not be accepted for wet/poor site conditions after weather events.

74. Building Envelope Testing is required to be contracted for per Division 8 quality requirements. The cost of this testing will be under the contract. The CONTRACTOR shall include a contract allowance of $2800 for these tests. Any retesting required due to failure will be at the CONTRACTOR's expense.

75. The streets around the Middle School have to be clear during arrival and dismissal times. (Arrival Mon – Fri 7:15 – 8:15 AM). (Dismissal Mon – Thu 2:30 – 3:30 PM and Fri 1:30 - 2:30 PM).

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other work of the Contract.

C. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 01: Fire Sprinkler Addition

1. Base Bid: As shown on plans

2. Alternate: Alternate to include all items per sheet A801 and associated consultant sheets. Alternate is to provide a room for a fire suppression entrance, fully sprinkler the addition, and extend the corridor at the SE entrance as shown. Corridor walls & doors indicated for 1 hr/20min respectively are to be non rated in alternate pricing. Fire dampers and any other fire penetration protection in corridor walls can be removed as well.

B. Alternate No. 02: Circle Drive

1. Base Bid: Grading plan and grass system as specified.

2. Alternate: Alternate to include the addition of a circle drive as shown on Civil plans. Alternate to include full road system, sidewalks, and site lights as shown. Ref. elec. for site plan.
3.
4.
5. END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 012300 "Alternates" for products selected under an alternate.
2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use facsimile of form provided in Project Manual.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from IBC 2015.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within [15] fifteen days of receipt of request, or [seven] 7 days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Change order markup explanation document.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue through Owner Rep supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect through Owner Rep will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request or 14 days when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.

d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
e. Quotation Form: Use forms acceptable to Architect.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

Union R-XI School District – Middle School
Modification/Explanation to the Change Order Fee

The maximum that will be allowed for overhead and profit on changes in work shall be as follows, expressed as a percentage of the basic cost of the change. The allowable percentages for profit or overhead may be less, depending on the nature, extent or complexity of the change, where the percentage is not commensurate with the responsibility and administration involved (such as the Contractor merely processing substantial Change Order to a Subcontractor) but in no event shall they exceed the following:

To the Contractor and/or its Subcontractor for work performed with their own forces 12%
To the Contractor for work performed by other than its own forces 5%
To the Subcontractor/Supplier for work performed with their own forces 12%
To the Subcontractor/Supplier for work performed by other than its own forces 5%

Not more than above specified percentages for overhead, profit and commission will be allowed to be added to the basic cost, regardless of the number of tiers of Contractors, Subcontractors or Sub-subcontractors.

The burden on labor may be indicated as a dollar/cents addition to the hourly rate or may be expressed as a percentage of the extended hourly rate costs. If required by the Owner, the Contractor shall provide a detailed breakdown to justify the labor burden. The Owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the cost of fringe benefits are in excess of established labor agreements.

Material, equipment, and supply costs shall be quoted at the actual cost to the Contractor, or Subcontractor. Upon request, the Contractor (or Subcontractor) shall submit evidence to substantiate the costs. Said costs shall be quoted at trade discount prices, with quantity discounts also applied where the quantities warrant. In any proposal with material, equipment and supply credit, the credit shall be based on the actual Contract cost of the material (including trade and quantity discounts) less any charges actually incurred for handling or returning a material which has been delivered.

The percentages allowed for overhead and profit herein shall be deemed to include, and no further addition allowed the Contractor, Subcontractor or Sub-subcontractors for: (1) field and office supervision and administration, including the field superintendent and non-working foremen; (2) general insurance; (3) use or replacement of tools; (4) shop burden; (5) engineering costs; (6) performance (guaranty) and labor/material payment bonds; (7) cost of safety measure (including those imposed by OSHA); (8) permits, unless a new permit type is required.

Cost changes shall be computed by determining the basic costs enumerated below (as further specified under this Subparagraph), to which the overhead may be added, then the profit figure may be added, and finally adding the sales tax on materials if allowable.

For changes in the Work, the cost shall be determined as provided under this section. The Contractor shall submit an itemized list of quantities with the applicable unit costs and extended price for each, in such form and detail as required by the Owner. As a minimum, the detailed breakdown shall include and indicate the items enumerated below. Items (a) and (b) constitute the cost of labor, and items (a), (b), (c) and (d) constitute the basic costs referred to under this section.

a) Labor costs, itemized by each trade involved, showing the hourly rates for each, and the hours required for the change. Labor rates shall be the same for extra and credit computations and shall be the actual rate paid the workmen in accordance with established management labor agreements.
b) Burden on labor, which shall be only the actual costs of mandatory fringe benefits required by established agreements, taxes on labor, worker's or workmen's compensation, insurance on labor

as affected by payroll, unemployment taxes and insurance, including FICA and FUTA. No other costs will be allowed as burden on labor.
c) Quantities of materials, equipment, and supplies, at their actual costs, with unit costs indicated.
d) The cost of subcontracted work computed in the same way as provided for under this section.
e) Overhead, profit and commission as set forth herein.
f) Applicable sales tax on materials, added after the above computations are complete.

Subcontractors (or Sub-subcontractors) shall compute their costs in the same way and are subject to the same conditions of what may be included in the cost and the same maximum percentages for overhead and profit. To the Subcontractor's price, the Contractor may add up to a maximum of five percent (5%). For changes involving work of the Contractor with its own forces and work by a Subcontractor (or Sub-subcontractor), the commission shall be applied directly to the Subcontractor's price, with the overhead and profit figure applied only to the Work the Contractor performs with its own forces.

For changes involving both extra and credit amounts, the overhead and profit, or commission, shall be applied only to net difference where the extra exceeds the credit.

For changes resulting in a credit in the basic costs, a reasonable allowance for overhead, profit or commission may be required to be credited to the Owner, as approved by the Owner. In general, no credit for overhead, profit or commission will be required where the net change credit is minor or where the Change in Work indicates it is reasonable that no credit be allowed to the Owner due to the effort, cost or responsibility of the Contractor. In the event of substantial subcontract credits or for Work the Contractor does not provide or perform, a reasonable overhead, profit or commission credit shall be allowed to the Owner, as determined by the Owner.

If anytime, Contractor is directed to proceed in writing by the Owner or Owner’s Representative on a time and material basis for a change. The Contractor must notify Owner’s Representative when work is beginning, when it is complete and daily tickets must be submitted as backup documentation. Daily tickets to be signed daily and verified by the Contractor’s onsite superintendent and submitted daily to the Owner’s Representative. Any change order request submitted without these daily signed tickets will be rejected and will not be compensated.

Additional scope that is authorized to be completed on a T&M basis on behalf of the Owner, shall be documented as follows:

a) Contractor shall issue daily tickets identifying hours worked, classification of worker, materials used, internally or externally rented equipment, and subcontractors utilized.
b) The additional scope should be delineated from the base bid scope.
c) Hours worked shall be verified by the General Contractor’s Superintendent and/or Authorized Owner’s Representative and indicated by signature on daily work tickets.
d) There should be a separate ticket for each day that additional scope of work takes place.
e) Unit costs, material costs and rental rates will be evaluated accordingly to typical market value.
f) The contractor is responsible for expending costs with the Owner’s best interest in mind.

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
4. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect through Construction Manager at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.
b. Name of Architect.
c. Architect's Project number.

d. Contractor's name and address.
e. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum. Amounts to be rounded to nearest whole dollar.
4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

5. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

6. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

a. Temporary fascilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Owner.

1. Initial Applicaiton for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect and Construction Manager will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Submittal schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Copies of building permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
8. Report of preconstruction conference.
9. Certificates of insurance and insurance policies.

H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706.
5. AIA Document G706A.
6. AIA Document G707.
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. BIM: Building Information Modeling.

B. RFI: Request for Information. Request from Owner,Owner Rep, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination: Each contractor shall cooperate with Project coordinator who shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its own operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect[and Construction Manager].
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. Architect's and Owner Rep Action: Architect and Owner Rep will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect or Owner Rep after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect or Owner Rep of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Owner Rep in writing within 10 days of receipt of the RFI response.

1.7 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Web-Based Project Software: Provide, administer, and use Ower Rep Directed web-based Project software site for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Web-based Project software site includes, at a minimum, the following features:

a. Compilation of Project data, including Contractor, subcontractors, Architect, architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
c. Document workflow planning, allowing customization of workflow between project entities.
d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
e. Track status of each Project communication in real time, and log time and date when responses are provided.
f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
g. Processing and tracking of payment applications.
h. Processing and tracking of contract modifications.
i. Creating and distributing meeting minutes.
j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
k. Management of construction progress photographs.
l. Mobile device compatibility, including smartphones and tablets.

2. At completion of Project, provide digital archive in PDF format.
3. Provide the following web-based Project software packages under their current published licensing agreements:
   a. Procore Technologies, Inc.

1.8 PROJECT MEETINGS

A. General: Owner Rep will schedule & conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Owner Rep, and Architect, within three days of the meeting.

B. Preconstruction Conference: Owner Rep will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Owner Rep, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Responsibilities and personnel assignments.
    b. Tentative construction schedule.
    c. Phasing.
    d. Critical work sequencing and long lead items.
    e. Designation of key personnel and their duties.
    f. Lines of communications.
    g. Use of web-based Project software.
    h. Procedures for processing field decisions and Change Orders.
    i. Procedures for RFIs.
    j. Procedures for testing and inspecting.
    k. Procedures for processing Applications for Payment.
    l. Distribution of the Contract Documents.
    m. Submittal procedures.
    n. Sustainable design requirements.
    o. Preparation of Record Documents.
    p. Use of the premise and existing building.
    q. Work restrictions.
    r. Working hours.
    s. Owner's occupancy requirements.
    t. Responsibility for temporary facilities and controls.
    u. Procedures for moisture and mold control.
    v. Procedures for disruptions and shutdowns.
    w. Construction waste management and recycling.
    x. Parking availability.
    y. Office, work, and storage areas.
    z. Equipment deliveries and priorities.
    aa. First aid.
    bb. Security.
    cc. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner Rep of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. Contract Documents.
    b. Options.
    c. Related RFIs.
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.
    g. Submittals.
    h. Sustainable design requirements.
    i. Review of mockups.
    j. Possible conflicts.
    k. Compatibility requirements.
    l. Time schedules.
    m. Weather limitations.
    n. Manufacturer's written instructions.
    o. Warranty requirements.
    p. Compatibility of materials.
    q. Acceptability of substrates.
    r. Temporary facilities and controls.
    s. Space and access limitations.
    t. Regulations of authorities having jurisdiction.
    u. Testing and inspecting requirements.
    v. Installation procedures.
    w. Coordination with other work.
    x. Required performance results.
    y. Protection of adjacent work.
    z. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Owner Rep will schedule & conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Owner, Owner Rep, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.
        4) Status of submittals.
        5) Status of sustainable design documentation.
        6) Deliveries.
        7) Off-site fabrication.
        8) Access.
        9) Site use.
        10) Temporary facilities and controls.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Status of correction of deficient items.
        14) Field observations.
        15) Status of RFIs.
        16) Status of Proposal Requests.
        17) Pending changes.
        18) Status of Change Orders.
        19) Pending claims and disputes.
        20) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

    a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Coordination Meetings: General Contractor will conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    c. Review present and future needs of each contractor present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.
        4) Status of submittals.
        5) Deliveries.
        6) Off-site fabrication.
        7) Access.
        8) Site use.
        9) Temporary facilities and controls.
        10) Work hours.
        11) Hazards and risks.
        12) Progress cleaning.
        13) Quality and work standards.
        14) Status of RFIs.
        15) Proposal Requests.
        16) Change Orders.
        17) Pending changes.

2. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
2. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
3. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
4. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
5. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
6. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification SectionsRetain "Email," "Web-Based Project Software," or "Paper" Subparagraph below.

1. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website: ProCore. Enter required data in web-based software site to fully identify submittal.
2. Cost of ProCore software is to be included in the bid and covered by the contractor.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow [15] days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow [15] days for review of each resubmittalRetain "Sequential Review" Subparagraph below if required.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's[and Construction Manager's] action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams that show factory-installed wiring.

b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches , but no larger than 30 by 42 inches.

a. PDF electronic file. Retain "BIM Incorporation" Subparagraph below when Project uses BIM through the Construction Stage and Contractor is required to prepare Shop Drawings for incorporation into the BIM. Revise as required to reflect Project scope agreements.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect and Construction Manager will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
    b.
        1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

E. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

F. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

G. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

a. Name of evaluation organization.
b. Date of evaluation.
c. Time period when report is in effect.
d. Product and manufacturers' names.
e. Description of product.
f. Test procedures and results.
g. Limitations of use.

1.7 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.Retain "BIM Incorporation" Paragraph below when Project uses BIM through the Construction Stage and delegated-design drawings and data will be incorporated into the BIM.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Construction Manager.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."

C. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp & upload to web-based Project software. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect and Construction Manager will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

A. Action Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required, and return it.Retain "PDF Submittals," "Paper Submittals," or "Submittals by Web-Based Project Software" Subparagraph below.

1. Submittals by Web-Based Project Software: Architect and Construction Manager will indicate, on Project software website, the appropriate action. Web-based Project software may define each type of action taken by Architect. Consult Owner's legal counsel and insert action terms and their definitions. See example in the Evaluations.

B. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.

C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

D. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
2. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements, consisting of multiple products, assemblies, and subassemblies.
3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.

E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect or Owner's Rep.

1.4 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

A. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
   1. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

   1. Specification Section number and title.
   2. Entity responsible for performing tests and inspections.
   3. Description of test and inspection.
   4. Identification of applicable standards.
   5. Identification of test and inspection methods.
   6. Number of tests and inspections required.
   7. Time schedule or time span for tests and inspections.

8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.

7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

    a. Provide test specimens representative of proposed products and construction.
    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.

    d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    f. When testing is complete, remove test specimens and test assemblies, and mockups, do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect[and Commissioning Authority][, through Construction Manager], with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect or Owner Rep.
3. Notify Architect and Owner Rep seven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's and Owner Rep approval of mockups before starting corresponding work, fabrication, or construction.

    a. Allow seven days for initial review and each re-review of each mockup.

7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
8. Demolish and remove mockups when directed unless otherwise indicated.

L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings developed as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph.

1.10 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.

2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Associated Contractor Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspection equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.11 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect Owner Rep and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect[and Commissioning Authority][, through Construction Manager,] with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and Owner's Rep reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 012300 "Alternates" for products selected under an alternate.
2. Section 012500 "Substitution Procedures" for requests for substitutions.
3. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.4 ACTION SUBMITTALS

A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a comparable product request. Architect will notify Contractor through Owner Rep of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

    a. Form of Architect's Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
    b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: …"

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: …"

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: …"

4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.

    a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: …"

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: …"

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.

a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: …"

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
2. Evidence that proposed product provides specified warranty.
3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
4. Samples, if requested.

B. Submittal Requirements: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
3. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

a. Primary operational systems and equipment.
b. Fire separation assemblies.
c. Air or smoke barriers.
d. Plumbing piping systems.
e. Mechanical systems piping and ducts.
f. Control systems.
g. Communication systems.
h. Fire-detection and -alarm systems.
i. Electrical wiring systems.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

a. Water, moisture, or vapor barriers.
b. Membranes and flashings.
c. Piping, ductwork, vessels, and equipment.
d. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect[and Construction Manager] promptly.

B. General: Engage a land surveyor professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect and Owner Rep when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Owner Rep.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
2. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
3. Section 017900 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at final completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect and Owner Rep. Label with manufacturer's name and model number.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's and Owner Rep signature for receipt of submittals.

5. Submit testing, adjusting, and balancing records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect[and Construction Manager] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.
5. Submit final completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect[and Construction Manager] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Submit list of incomplete items in the following format:

    a. PDF electronic file. Architect, through Owner Rep, will return annotated file.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Wipe surfaces of mechanical and electrical equipment[, elevator equipment,] and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

o. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
p. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Emergency manuals.
3. Systems and equipment operation manuals.
4. Systems and equipment maintenance manuals.
5. Product maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect and Owner Rep will comment on whether content of operation and maintenance submittals is acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:

1. Submit on digital media acceptable to Architect Enable reviewer comments on draft submittals.

C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect or Owner Rep will return copy with comments.

1. Correct or revise each manual to comply with Architect's and Owner Rep comments. Submit copies of each corrected manual within 15 days of receipt of comments and prior to commencing demonstration and training.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of content, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.

3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.

6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

I. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of maintenance manuals.

1.10 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints and one of file prints.
2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit PDF electronic files of scanned record prints and one set(s) of prints.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Record data as soon as possible after obtaining it.
c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file[with comment function enabled].
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.

1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

4. Note related Change Orders[, record Product Data,] and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect'sreference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Instruction in operation and maintenance of systems, subsystems, and equipment.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

1. At completion of training, submit complete training manual(s) for Owner's use prepared in same PDF file format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Regulatory requirements.
    e. Equipment function.
    f. Operating characteristics.
    g. Limiting conditions.
    h. Performance curves.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Systems and equipment operation manuals.
    c. Systems and equipment maintenance manuals.
    d. Product maintenance manuals.
    e. Project Record Documents.
    f. Identification systems.
    g. Warranties and bonds.
    h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

    a. Instructions on meaning of warnings, trouble indications, and error messages.
    b. Instructions on stopping.
    c. Shutdown instructions for each type of emergency.
    d. Operating instructions for conditions outside of normal operating limits.
    e. Sequences for electric or electronic systems.
    f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.

d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning.
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

1.7 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner with at least seven days' advance notice.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode with vibration reduction technology.

1. Submit video recordings on CD-ROM or thumb drive.
2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents:

    a. Name of Contractor/Installer.
    b. Business address.
    c. Business phone number.
    d. Point of contact.
    e. Email address.

C. Narration: Describe scenes on video recording by [audio narration by microphone while] [dubbing audio narration off-site after] video recording is recorded. Include description of items being viewed.

D. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017900

SECTION 02000
EARTHWORK

PART 1 - GENERAL

CLEARING AND GRUBBING

The Consultant will establish right-of-way and construction lines and will designate all trees, shrubs and plants that are to be removed. Vegetation designated to remain shall be preserved without damage. All trees, stumps, brush and hedge not designated to remain shall be cleared and grubbed as required and shall be disposed of in an acceptable manner.

Stumps and roots in cut areas shall be grubbed to a depth of not less than 12 inches below the finished earth grade. Except in areas to be excavated, stump holes shall be backfilled with suitable material and compacted to the approximate density of the adjacent area.

All burning of products of clearing and grubbing shall be done under the care of a competent watchman at such times and in such manner that neither vegetation on adjacent land nor that designated to remain will be jeopardized. The Contractor shall be responsible for confirming with the local Fire Department the ability to burn materials on the site and shall be solely responsible for the control and coordination of burning operations. Waste material shall be disposed of on the site by the Contractor in locations other than those to be covered with buildings, streets or parking areas and as designated by the Engineer.

All areas where excavation or embankment is to be made shall be stripped. Stripping shall include the removal of material such as sod, grass, residue of agricultural crops, sawdust and organic topsoil from the surface of the ground without removing more earth than is necessary, as directed by the Engineer. The products of stripping shall be deposited at the toe of embankments as directed by the Engineer, where such areas are available. If such areas are not available, the products shall be neatly and uniformly stockpiled as directed by the Engineer in such manner that no drainage will be blocked upon completion.

BORROW AND WASTE

Borrow will consist of approved material, free of trees, stumps, rubbish and other deleterious material, required for the construction of embankment or for other portions of the Work and shall be obtained from areas shown on the Plans or from other areas designated by the Engineer. All excess excavated material shall be placed in areas designated by the Owner, or with the approval of the Engineer, may be used to flatten slopes. Final lines and grades shall be subject

to approval of the Engineer and no extra payment shall be made on account of any increased seeding, mulching or compaction required by such operations.

EXCAVATION

A. GENERAL. Prior to beginning excavation and filling operations in any area, all necessary clearing, grubbing and stripping in that area shall have been performed. The excavation shall be made to the designated alignment, grade and cross section as established by the Engineer. Side slopes, cuts and fills shall be finished to a reasonable smooth and uniform surface that will merge with the adjacent terrain without variations readily discernible. All excavation shall be by open cut unless specifically approved otherwise.

B. CLASSIFICATIONS. All excavation shall consist of two classifications: Class "A" and Class "B"

1. CLASS "A" EXCAVATION. Any materials shall consist of all other materials not to be mentioned in Class "B". The decisions of the Consultant shall be final on the determination of the property classification.

2. CLASS "B" EXCAVATION. Any materials shall be considered Class "B" excavation, which, in the opinion of the Consultant, cannot be excavated by any process other than drilling and blasting or drilling and wedging. The classification shall not be extended to include the materials which can be removed by other means, but which for reasons of economy in excavation; it is preferred to remove by drilling and blasting or drilling and wedging. Such excavation shall include detached pieces of rock or boulders one cubic yard or more in content and masses of solid, well defined ledges of stone or masses of rock, slate, shale or soapstone and other similar substances. Class "B" excavation shall be stripped for measurement in sections of such length as the Consultant may direct, and no rock excavated or blasted before such measurement will be allowed. Stripping shall mean the removal of all other materials so as to expose the surface of the rock.

a. EXPLOSIVES. Explosives shall only be used of such character and strength and in such manner as may be permitted by the Consultant. All necessary precautions shall be taken to prevent accidents and injury or damage to adjacent buildings or utilities. Blasts shall be completely and carefully covered with heavy timbers or other adequate protections and shall be made only between such hours as

may be designated by the Consultant. The Contractor shall be liable for all injuries or deaths of persons or damages to property caused by blasting or explosives.

b. MEASUREMENT. All Class "B" excavations shall be measured in place by the cubic yard. No loose, shaken or previously blasted rock will be allowed as Class "B" excavation, nor shall any excavation exterior to the maximum limits of measurement be allowed.

ADJACENT AREAS

Where adjacent lawn or surface areas to within the project site, but outside the contract limits for grading, are disturbed as a result of building operations or storage of materials under this Contract, they shall be cleaned of all debris and restored to original grades and condition.

CONTROL OF SURFACE WATER

The surface of the borrow area or areas to receive fill material shall be worked in such a manner that any rain falling inside the area will be rapidly drained off or accumulated in a sump form which it may be pumped and disposed of in a manner satisfactory to the Engineer.

Should wet excavation be encountered, water shall be controlled by pumping from a sump or other methods acceptable to the Engineer. The Contractor shall be prepared to keep the excavation free of accumulated water at all times.

FILLING

In all areas where filling is to be done, the area shall be broken up by plowing, scarifying, or stripping to a minimum depth of six inches. This area shall be compacted in the same manner as that required for the embankment placed on the area.

Fill materials shall be placed in layers not exceeding six inches (loose measurement) and shall be compacted as specified before the next layer is placed. The layers shall be placed approximately parallel to both the proposed profile grade and to the finished grade and shall be kept to such a contour that it will not impound water. Effective spreading equipment shall be used on each lift to obtain uniform thickness prior to compacting. Continuous leveling and manipulating will be required during compacting operations. Construction equipment shall be routed uniformly over the entire surface of each layer.

Occasional stones or rock fragments, etc. exceeding the thickness of six inch layer shall be disposed of by being incorporated into the embankment outside the limits of the proposed streets. The thickness of the layer in these areas may be increased if necessary to accommodate the stones, but shall not exceed eight inches in thickness (loose measurement). The stones or rock fragments are to be placed so there will be no nesting.

FROZEN MATERIAL

Construction of embankments shall not be started on foundation soil having more than 0.1 foot of frost, nor shall embankment be built of frozen material. Frozen ground on a partially completed fill shall be removed before placing additional material on the embankment.

COMPACTION

All fill placed shall be compacted to a minimum density of 90% Modified Proctor (ASTM D-1557) to form a stable structure. If unacceptable soils are placed, they shall be removed at the Contractor's expense. The acceptable moisture contents during filling operations are those at optimum moisture content or above at which satisfactory dry densities will result. Compaction operations shall be conducted at all times filling operations are being performed.

Grading will be prohibited during periods of excessive moisture or excessively dry soil conditions. Compaction may be obtained by mixing dry with wet soil under excessive moisture conditions or be spreading water during excessively dry conditions.

FILL COMPACTION EQUIPMENT

Compacting equipment shall consist of:

A. Tamping rollers with a minimum drum diameter of 60 inches and with a tamping foot extending at least six inches from the barrel of the roller. Said roller shall weigh not less than 40 psi based on the contract area of one row of feet; or

B. Pneumatic-tired roller of equivalent compaction characteristics, as determined by the Consultant; or

C. Vibratory rollers acceptable to the Consultant; or

D. High Speed, impact-type drum rollers acceptable to the Consultant. Said roller shall be designed such as to avoid creation of a "layered" fill without property blending of successive layers of fill; or

E. Any other compaction equipment approved by the Engineer.

FINAL SURFACE LEVELING OPERATING

The entire excavated area shall be finished to the required grade elevations. The surface shall be struck off, free from all ruts and depressions. The final grade elevations shall not exceed 0.10 feet variation from proposed sub-grade elevation. The slopes shall be graded smooth, free from wash or equipment depressions, to within the specified limits. All slopes shall be graded true to slope as specified herein and as indicated on the Drawings.

PAYMENT

The cost of this work shall be included in the bid.

END OF SECTION 02000

SECTION 02100
AGGREGATE BASE COURSE

PART 1 – GENERAL

DESCRIPTION

This work shall consist of furnishing and placing one or more courses of aggregate on a prepared sub-grade in accordance with MoDOT Section 304 in the latest edition of the Missouri Standard Specifications for Highway Construction.

MATERIAL

All material shall be in accordance with Division 1000, Material Details. Aggregate for base shall be in accordance with Section 1007 of the latest edition of the Missouri Standard Specifications for Highway Construction.

PLACING & COMPACTION

The contractor shall place base material on the roadbed as shown in the contract documents and design plans. The maximum compacted thickness of any one layer shall not exceed 6 inches.

Aggregate base under both roadway and shoulders shall be compacted to no less than standard maximum density per the Missouri Standard Specifications for Highway Construction.

END OF SECTION 02100

SECTION 02200
STORM SEWERS AND DRAINAGE STRUCTURES

PART 1 – GENERAL

SCOPE

This section of the Specifications covers the construction of storm drainage facilities, complete, including all piping, inlets, and related appurtenances in accordance with details and location shown on the Drawings and with requirements set forth herein.

LOCATION AND GRADE OF SEWERS

Both horizontal and vertical alignment of sewers and appurtenant structures shall conform to details shown on the Drawings.

MATERIALS

A. CONCRETE. All Concrete materials required in construction of sewer appurtenances, as well as all methods for mixing and placing, shall conform with Section 501 of the Missouri Standard Specifications for Highway Construction 2004 Edition for Class "B" concrete.

B. MORTAR. Mortar shall be one part Portland Cement, A.S.T.M. C150, Type II, one-half part hydrated lime, A.S.T.M. C207, and three parts fine aggregate concrete sand which has been sieved through an 8-mesh screen. Cement, lime and sand shall be thoroughly mixed dry and only enough water added to form a mortar of the proper consistency.

C. REINFORCING STEEL. Unless otherwise specified, reinforcement shall be deformed bars meeting the requirements of one of the following:

1. A.S.T.M. A615-75, Deformed Billet – Steel Deformed Bars for Concrete Reinforcement, Grade 40 or Grade 60.

2. A.S.T.M. A616-75, Rail-Steel Deformed Bars for Concrete Reinforcement.

3. A.S.T.M. A617-75, Axle-Steel Deformed Bars for Concrete Reinforcement.

4. Welded steel wire fabric shall conform to requirements of A.S.T.M. A185-73.

D. CASTINGS. Cast iron frames, tops, covers, gratings and all cast iron fittings shall be sound, true to form and thickness, and neatly finished. Casting shall conform to the requirements of the Standard Specifications for Gray Iron Fittings, A.S.T.M. serial designation A-48-48, Class 30 and subsequent revisions.

All castings not coated or with damaged coating shall be given one coat of coal tar pitch or asphalt varnish after inspection of the job.

All castings shall be of the type shown on the Plans. Where a particular manufacturer's brand and part of figure number is specified, another brand and part or figure number may be used if of equal weight and strength and equivalent dimensions and area of openings. All castings shall be approved before ordering.

E. STORM SEWER PIPE. Pipe for storm sewers shall conform to the following requirements:

1. POLYETHYLENE PIPE. All storm sewers to be supplied under this specification shall be high density polyethylene corrugated exterior/smooth interior pipe. Four-through 10-inch diameters shall meet all requirements of AASHTO M252 with the addition that the pipe have a smooth interior liner. Twelve to 36-inch diameters shall conform to AASHTO M294 Type S. Forty-two and 48-inch diameters shall minimum pipe stiffness of 20 and 17 psi, respectively, at 5% deflection; and shall meet all other requirements for AASHTO M294. 2.2.2.1. Joint and Fittings. Pipe joints and fittings shall conform to AASHTO M252 or AASHTO M294, or be approved by the Engineer.

2. REINFORCED CONCRETE PIPE. All storm sewer supplied under this specification shall be Class III Reinforced Concrete Pipe. All pipe shall meet the requirements of the latest edition of "Missouri Standards Specifications for Highway Construction" as published by the Missouri Highway and Transportation Commission, Jefferson City, Missouri.

3. CORRUGATED METAL PIPE. All storm sewer supplied under this specification shall be 14 gauge aluminized helically corrugated pipe with welded joints and reformed ends. All pipe shall meet the requirements of the latest edition of "Missouri Standards Specifications for Highway Construction" as published by the Missouri Highway and Transportation Commission, Jefferson City, Missouri.

4. POLYPROPYLENE CULVERT PIPE: Acceptance of polypropylene pipe will be based upon the pipe being in accordance with the latest edition of Section 1041 of the Missouri Standard Specifications for Highway Construction. Manufacturers furnishing pipe to all projects shall be included on approved list of the Construction and Materials Division of the Missouri Department of Transportation. Polypropylene pipe may be used under driving surfaces when used in compliance with these specifications and standard plans. End sections shall be precast concrete.

UNDERGROUND CONSTRUCTION

Underground pipe construction shall be in accordance with the recommended practice as outlined by the pipe manufacturer.

All excavations shall be made to such depths and widths as will give ample room for building all structures, sewers, and appurtenances as detailed in the Drawings.

Clearing and grubbing the site of Work, excavation of earth or other materials, sheeting and bracing, pumping and drainage, backfilling, rough grading, and cleaning up all shall be done as specified. In addition, all Work maintaining or replacing existing fences, roadway, drivers, lawns, or structures disturbed by the Work, safety precautions and other miscellaneous general work not specified under specific items is to be included in the Work done under this section.

SEWER PIPES

All sewer pipes shall be laid accurately to the lines and grades indicated on the Drawings. The trench excavations shall be of sufficient width to properly construct the joints and to allow for inspection of proper bedding of the pipe. In all cases, the bottom quadrant of the pipe trench should be carefully shaped at proper intervals so that no part of the load is supported by the pipe bells. The full load should rest on the barrel of the pipe.

To assure stable pipe bedding, mechanical excavation should be made four inches below the bottom of the pipe grade. A layer of compacted granular material at least four inches thick, shall be provided to stabilize the trench bottom.

The grades to which all sewer lines are laid shall be accurately controlled, providing grade stakes and batter board at 25-foot intervals and checking invert elevations with a grade rod from an established grade line.

A laser beam may be used to attain proper alignment of sewer pipe during construction. However, if such a device is used, a blower of sufficient capacity to prevent diffraction of the beam by fumes from joint lubricant must be used.

No pipe shall be installed in the trench until the bottom of the trench has been property shaped and its conditions, line, and grade approved by the Engineer.

All sewers must be laid in a straight line so that a light can be seen from one end to the other. Pipe shall be laid with the spigot end downstream entering the bell to full depth, and in such manner as not to drag earth into the joints. Pipe sections shall be fitted together and matched so that, when laid, they will form a sewer with a smooth and uniform invert. Installation shall be in accordance with manufacturer's recommendations.

Wherever obstructions are encountered during the progress of the Work and interfere to such an extent that an alteration in the Plan is required, the Engineer shall have the authority to change the Plans and order a deviation from the line and grade or arrange with the Owners of the structures for the removal, relocation, or reconstruction of the obstructions.

CUTTING AND TRENCHING EXCAVATION

If local conditions permit their re-use, all surface materials suitable for re-use in restoring the surface shall be kept separate from the general excavation material.

All excavated material unsuitable for backfill shall be removed and disposed of off of the site, by and at the expense of the Contractor.

All excavated material shall be piled in a manner that will not endanger the Work and that will not avoid obstructing walks and driveways. Ditches shall be kept clear or other satisfactory provisions made for drainage.

All excavations shall be made to such depths and widths as detailed on the Drawings, or as embodied in the Specifications or as will give ample room for carrying on the required construction operations.

No excavated trench shall be wider than 1-4/10 items the pipe diameter in inches plus 12 inches (width +1.4d" + 12") or two fee wide or as designated by the Engineer.

Granular backfill material shall be tamped into the trench uniformly on both sides of the pipeline for the full width of the trench, up to the horizontal diameter of the pipeline.

No large rocks shall be allowed in contact with the pipe either in the bed or the backfill. Large rocks occurring in the bed shall be removed and the resulting hole filled with gravel.

Bell holes shall be of ample depth to permit the barrel of the pipe totally flat on the trench bottoms, but they shall not be larger than necessary of properly making the joint.

TRENCH EXCAVATION CLASSIFICATIONS

All excavation shall consist of two classifications: Class "A" and Class "B".

A. CLASS "A" EXCAVATION. Class "A" excavation shall consist of all other materials not to be mentioned in Class "B". The decision of the Consultants shall be final on the determination of the proper classifications.

B. CLASS "B" EXCAVATION. Any materials shall be considered Class "B" excavation, which, in the opinion of the Consultant cannot be excavated by any process other than drilling and blasting or drilling and wedging. The classification shall not be extended to include the materials which can be removed by other means, but which, for reasons of economy in excavation, it is preferred to remove by drilling and blasting or drilling and wedging. Such excavation shall include detached pieces or rock or boulders one cubic yard or more in content and masses of solid, well-defined ledges of stone or masses of rock, slate, shale or soapstone and other similar substances. Class "B" excavation shall be stripped for measurement in sections of such length as the Consultant may direct, and no rock excavated or blasted before such measurements will be allowed.

   Stripping shall mean the removal of all other materials so as to expose the surface of the rock.

   1. EXPLOSIVES. Explosives shall only be used of such character and strength and in such manner as may be permitted by the Engineer. All necessary precautions shall be taken to prevent accidents and injury or damage to adjacent buildings. Blasts shall be completely and carefully covered with heavy timbers or other adequate protections and shall be made only between such hours as may be designated by the Engineer. The Contractor shall be liable for all injuries or deaths of persons or damages to property caused by blasting or explosives.

   2. MEASUREMENT. All Class "B" excavations shall be measured in place by the cubic yard. No loose, shaken or previously blasted rock will be allowed as Class "B" excavation, nor shall any excavation exterior to the maximum limits of measurements be allowed.

SHEETING AND BRACING

Furnish, put in place and maintain such sheeting, braces, rangers, and other timbering as may be required to support the sides of the excavation and to prevent any movement which could in any way injure the sewers, diminish the necessary width of the excavation or otherwise injure or delay the Work or endanger adjacent pavements, buildings, sewers, pipes, drains, conduits or other structures or the lives of workmen employed thereon. The Engineer may direct that sheeting in the trench be cut off at any specified elevation and in no case without permission shall timber be left in the ground above an elevation 18 inches below the surface of the ground.

All timber which may not be left in place under the foregoing provisions of this Specification shall be removed in such manner as not to endanger adjacent pavements, structures or property or to cause movement of the pipe or endanger the structure build in the excavation from which the timber of sheeting is being removed or adjacent thereto. All voids left by withdrawal of sheeting shall be immediately refilled with sand or fine earth by ramming with tools especially adapted to that purpose, by watering, or otherwise as may be directed by the Engineer.

LAYING PIPE

The pipe lines shall be constructed of such sizes and laid accurately to such lines and grade as are shown in the Drawings. Pipe material shall meet the requirements of the material Specifications. Branches, fittings and specials shall be provided, and when not to be immediately used shall be closed with earthenware or pre-cast concrete stoppers sealed in place with bituminous mastic. When immediate use is to be made of them, they may be closed with a plywood stopper. The sewer at the end of the day's laying shall be closed with dirt-tight temporary stopper.

Variance from established line and grade shall not exceed ¼ inch, provided that any such variation does not result in a level or reverse sloping invert; provided also, that variation in the invert elevation between adjoining ends of pipe due to non-concentricity of joining surface and pipe interior surfaces does not exceed ¼ inch maximum.

Unless otherwise permitted, at least four finished joints shall be left exposed for inspection through out the working day, and any and all sections of the pipe laid shall be made accessible for inspection at any time while the Work is progressing.

Pipe shall not be laid in water. No walking on or working over the pipe will be permitted after they are laid except as may be necessary for backfilling and tamping.

Pipe shall be laid true to line and grade shown in the Drawings and shall be firmly supported for its entire length when laid in trench.

BACKFILLING FOR TRENCHES

A. GENERAL. When the pipe is laid, the Contractor shall backfill under and around the pipe as specified in "Pipe Bedding." The remainder of the trench shall then be carefully backfilled simultaneously on both sides of the pipe. Broken concrete or pavement, blasted rock and large boulders shall not be used as backfill materials. Any trenches improperly backfilled, or where settlement occurs, shall be repaired as directed by the Engineer.

B. BACKFILL IN PAVED AREAS. In areas of existing or proposed pavement or rock surfaces, the entire backfill shall consist of well graded 1" minus crushed limestone. The backfill material shall be compacted to 90% of the Modified Proctor density by an acceptable method to ensure that no pavement settlement of the completed backfill will occur. All areas of existing pavement damaged during construction shall be repaved with three inches of Type "C" asphaltic pavement and installed in accordance with the latest edition of the Missouri Standard Specifications for Highway Construction. Edges of the existing pavement shall be neatly cut in a straight line, removing all damaged pavement prior to repaving.

C. BACKFILL IN AREAS THAT ARE NOT PAVED. The entire backfill for trenches in these areas shall be compacted to 85% of the Modified Proctor density as indicated in the Plans and shall be repaired as directed by the Engineer. It is the intent of theses Specifications to secure a condition where no further settlement of trenches will occur after backfilling is completed.

D. COMPACTION. Care shall be exercised not to disturb pipe when placing backfill. All backfill of trenches shall be placed in compacted lifts not to exceed eight inches in thickness, and each lift shall be compacted in a manner approved by the Engineer.

E. RESPONSIBILITY OF CONTRACTOR FOR BACKFILL SETTLEMENT. The Contractor shall be responsible for the satisfactory compaction of backfill material described. If any trenches or other excavation are found to have settled, they shall be immediately reworked by the Contractor and restored to the specific grades. In addition, the Contractor shall be responsible for all damage or damages which might result from settlement of backfill made

by him on the fulfillment of his contract within and during the period of one year from and after the date of final acceptance thereof by the Owner.

F. FINISH GRADING. The finishing of side slopes, cuts, and fills shall be reasonable smooth uniform surfaces that will merge with the adjacent terrain without noticeable break. Finishing shall be done in accordance with grades shown on the Drawings and without variations that are readily discernible.

TESTING OF SEWERS

A. GENERAL. After construction and backfilling are completed and before any services are connected to the sewers, the completed lines shall be tested for leaks and visually checked for straightness of line and cracked pipe. If any deficiencies inline or grades are found which will be detrimental to the proper functioning of the sewer, the deficiencies shall be corrected. Any damaged or cracked pipe shall be excavated and re-laid in a manner satisfactory to the Engineer. Any section of sewer which is found to be leaking in excess of the allowable quantity shall be repaired.

B. ACCPETANCE TESTS. The Contractor shall furnish all equipment necessary for testing. Each reach of sewer shall meet the requirements of the following acceptance tests. All defects shall be repaired to the satisfaction of the Engineer.

1. LAMPING. Each section of sewer line between manholes shall be straight and uniformly graded. Each such section will be lamped. Lamping will be performed by the Engineer.

2. EXFILTRATION. The total exfiltration shall not exceed 200 gallons per inch of nominal diameter per mile of pipe per day. For purposes of determining maximum allowable leakage, manholes shall be considered section of 48-inch pipe.

3. INFILTRATION. Pipe joints shall be protected from damage in the field prior to laying. Lubricants, primers, adhesives, etc., shall be recommended by the pipe manufacturer's specifications to obtain the degree of water-tightness required. The maximum rate of infiltration shall not exceed 200 gallons per inch of pipe diameter per day per mil when tested in accordance with the testing procedure set up in A.S.T.M. Designation C-425. If infiltration exceeds this rate, the leakage source(s) shall be located and repairs made as necessary.

MANHOLE AND CATCH BASIN MATERIALS

A. MANHOLE CONSTRUCTIONS. Manholes of the dimensions shown on the Plans shall be built at the points indicated on the Plans or directed by the Engineer as rapidly as the construction of the sewer will permit. Manholes shall be pre-cast concrete construction in accordance with the following requirements.

B. PRE-CAST MANHOLES. Pre-cast manholes shall conform with A.S.T.M. C-478 and with design dimensions. Cones and sections shall be substantially free from fractures, large or deep cracks and surface roughness.

All lift holes shall be thoroughly wetted and then be completely filled with mortar, smoothed and pointed to insure water-tightness.

All joints between pre-cast elements on manholes shall be made with an approved bitumastic material or an approved rubber gasket.

The first pre-cast barrel section shall be positioned and carefully adjusted to true grade and alignment. Manhole connections for inlet pipes shall be in accordance with the Drawings. All inlet pipes shall be properly installed with the base section so as to form an integral watertight unit. The base section shall be cast in place to form a watertight unit with the first barrel section.

Pre-cast sections shall be placed and aligned to provide vertical sides and vertical alignment of the ladder rungs. The completed manholes shall be rigid, true to dimensions, and watertight.

Tops of manholes shall be built up to the elevations indicated on the Plans. Where no elevation is indicated, they shall be built to the existing ground surface unless the Engineer shall direct otherwise.

C. FRAMES AND COVERS. Frames and covers shall be of the type and duty shown on the Plans. Iron castings shall conform to the latest revision of A.S.T.M.

Specifications A-48, Class 20. All castings shall be true to pattern in forms and dimensions, free from faults, sponginess, cracks, blowholes, and other defects affection their strength. Bearing surfaces between cast frames and covers shall be machined, fitted together, and match-marked to prevent rocking.

END OF SECTION 02200

SECTION 02300
WATER MAIN SUPPLY PIPING, VALVES, AND FITTINGS

1. Materials of Construction

Piping, valves, and fittings shall be furnished and installed in accordance with the manufacturer's requirements. All pipe and materials shall be new and in a condition satisfactory to the City of Washington. Materials of construction for water supply pipes and fittings shall be as follows:

A. Water main:

i. C900 PVC Water Mains: All water mains shall be designed with a pressure rating of one and one half (1.5) times the operating pressure. Water mains may be AWWA conforming C900 DR 14 Class 200. Pipe must bear the seal and approval of the National Sanitation Foundation. Net laying lengths must be twenty (20) feet. Joints shall be integral bell position joints with single rubber gasket making a pressure tight seal.

ii. Ductile Iron Pipe: Ductile iron pipe for use on water mains under these specifications shall be cement lined super bell-tite push-on joint; manufactured of materials and methods meeting the tests set forth in the latest revision of ANSI A21.51 (AWWA C151) for Class 50 ductile iron pipe. Pipe shall have a working pressure of three hundred fifty (350) psi.

iii. Fitting for PVC Mains: For PVC pipe flanged and/or mechanical joints cast iron fittings for PVC pipe shall be used and shall meet the requirements of ANSI A21.11 (AWWA C111). Fittings shall include appropriate transition gaskets.

iv. Valves for PVC: Valves for water lines shall be Mueller Model A-2360-20 mechanical joint, non-rising stem, resilient wedge, gate valves or approved equal. Each valve shall include the required Mueller mechanical joint accessories. Said valves shall be of the size required in the approved plans. All valves shall be manufactured in accordance with AWWA Standards C-509.

v. Valves for Ductile Iron Pipe: Valves for water lines shall be Mueller Model A-2360-20 mechanical joint, non-rising stem, resilient wedge gate valve or approved equal. Each valve shall include the required Mueller Mechanical Joint Accessories. Said valves shall be of the size required in the approved Plans. All valves shall be manufactured in accordance with AWWA Standard C509.

vi. Valve Boxes: Valve boxes shall be Mueller Model H-10360 buffalo-type with lid as manufactured by the Mueller Company or approved equal.

vii. Fire Hydrants: Fire hydrants shall comply with American Water Works Association specifications. Hydrants shall have: two-piece standpipe; compression type main valve; five and one-fourth (5 ¼) inch valve opening; two (2) two and one-half (2 ½)

inch hose nozzles; one (1) four and one-half (4 ½) inch pumper nozzle; mechanical joint inlet with cast iron retainer glands; 7/8 inch square operating nut to open counter clockwise. Cast iron fitting shall be cement mortar lines with bituminous seal coat inside and out. Inlet connection shall be ten (10) inch mechanical joint. Fire hydrants shall be Model 423 as manufactured by the Mueller Company, or approved equal. Said hydrants shall be equipped with auxiliary gate valve and valve box and Mueller transition gland (A-399).

viii. Tapping Sleeve: Tapping sleeves for water lines shall be Mueller Mechanical Joint Model H-304, Stainless Steel, and Flanged outlet as manufactured by the Mueller Company or approved equal.

ix. Tapping Valve: Tapping valves for water lines shall be Mueller flanged to mechanical Model T-2360-16, non-rising stem, resilient wedge seat, tapping valves or approved equal. Each valve shall include the required Mueller transition glands (A-399). Said valves shall be of the size required in the approved plans. All valves shall be manufactured in accordance with AWWA Standards C-509.

x. Detectable Locator Tape: Detectable locator tape shall be three (3) inches wide, bonded layer plastic with magnetic foil core, Terra Tape Detectable, as manufactured by Griffolyn Company of Houston, Texas, and shall have the words "Caution: Water Main Buried Below", or approved equal.

xi. Waterline Locator Wire: Waterline locator wire shall be #12 copper wire, solid or strand, insulated for 600 V with splice points near valve boxes.

B. Water service:

i. Service Saddles: Service saddles for water lines two (2) inches to twelve (12) inches shall be Mueller Bronze H-13000 series or approved equal, with tapped outlet as manufactured by the Mueller Company or approved equal.

ii. Corporation Stops: Corporation stops for service connections three-fourths (¾) inch to two (2) inches shall be Mueller B-25008 or approved equal, "CC" Thread with compression connections. Larger sizes to be approved by the City of Washington.

iii. Curb Values: Curb values for service connections three-fourths (¾) inch to two (2) inches shall be Mueller H-15209 or an approved equal, compression connections both ends. Larger sizes to be approved by the City of Washington.

iv. Curb Box: Curb box for service connections three-fourths (¾) to one (1) inch shall be Mueller H-10316; one and one-half (1 ½) inches to two (2) inches shall be Mueller H-10336 or approved equal, thirty-six (36) inch to forty (40) inch bury.

v. Service Piping: Service piping shall be Type K – copper tubing three-fourths (¾) inch to two (2) inches, with thirty-six (36) inches of minimum cover. Service lines must be inspected by the City of Washington prior to backfilling.

vi. Meters: Service meters shall be a Schlumberger T-10 five-eighths (5/8) inch to two (2) inches available from the City of Washington. All meters must be proceeded immediately by a ball valve. Meter shall also be equipped with an ASSE approved dual check valve. Meters are to be installed horizontal and sizes larger than two (2) inches to be approved by the City of Washington. When necessary to install meter in an outside pit, plans and specifications shall be submitted to the City of Washington for approval.

All pipe and materials described above shall be of new materials in a condition satisfactory to the City of Washington. All pipe and fittings shall be unloaded, hauled, and handled with care to prevent injury to the pipe. Proper methods and equipment shall be used for safe handling. Should a defect, gouge, or crack be discovered in any pipe, the crack or defective portion shall be cut off before being installed so that the pipe will be perfectly sound. The cut shall be made in the sound barrel at a point at least twelve (12) inches beyond the visible limit of the defect.

The interior of the pipe shall be thoroughly cleaned of all foreign matter and shall be kept clean during operations by means of plugs or other approved methods. At all times when work is not in progress, all open ends of pipes and fittings shall be securely closed. Tees and fittings at bends in pipe shall be properly braced with substantial concrete thrust blocks.

2. Excavation of Trenches

A. General: The Contractor shall control the grading in the vicinity of pipe trenches so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Any water or other liquid wastes, which accumulate in the excavations, shall be removed promptly.

The Contractor shall perform all excavation work necessary for and incidental to the proper construction of the water lines as shown on the approved plans or directed by the City of Washington. Excavation shall include the removal of trees, shrubs, and undesirable material. Excavation shall be done along the lines indicated on the approved plans and shall be continuous and straight without improper bends and kinks. Trenches shall be only of sufficient width to provide a free working space on each side of the pipe. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner a sufficient distance from the banks of the trenches to avoid overloading which might cause slides or cave-ins. All excavated material not suitable for backfill shall be removed by the Contractor and disposed of in a manner approved by the City of Washington. The Contractor shall provide all barricades, lights, temporary crossings, warning signs, etc. that may be necessary to properly protect the public and the work from injury or damage.

B. Depth: Trenches for water pipe shall be opened to a sufficient depth to obtain a minimum of forty-two (42) inches of cover over the top of the pipe. All excavation shall be made so as to provide a continuous bearing for the barrel of the pipe. Bell holes shall be excavated to sufficient size to permit ample room for making joins. The bottom of trenches shall be free from rocks, clods, debris and other unsuitable material and shall consist of properly shaped earth or tamped granular material as specified herein. The Contractor shall be careful not to excavate below grade except to remove undesirable material, or as directed by the City of Washington.

C. Width: No excavated trench shall be wider than one and four-tenths (1 4/10) times the pipe diameter in inches plus twelve (12) inches (width = 1.4d" + 12") or two (2) feet wide or as designated by the City of Washington

D. Trench Excavation Classifications: All excavation shall consist of two (2) classifications: Class "A" and Class "B".

i. Class "A" Excavation: Class "A" excavation shall consist of all other materials not mentioned in Class "B". The decision of the City of Washington shall be final on the determination of the proper classification.

ii. Class "B" Excavation: Any material shall be considered Class "B" Excavation, which in the opinion of the City of Washington, cannot be excavated by any process other than drilling and blasting or drilling and wedging. This classification shall not be extended to include the materials, which can be removed by other means, but which for reasons of economy in excavation, it is preferred to remove by drilling and blasting or drilling and wedging. Such excavation shall include detached pieces of rock or boulders one (1) cubic yard or more in content and masses of solid, well-defined ledges of stone or masses of rock, state, shale or soapstone and other similar substances. Class "B" Excavation shall be stripped for measurement in sections of such length as the City of Washington may direct and no rock excavated or blasted before such measurements will be allowed. Stripping shall mean the removal of all other materials so as to expose the surface of the rock.

a. Explosives: Explosives shall only be used of such character and strength and in such manner as may be permitted by the City of Washington. All necessary precautions shall be taken to prevent accidents and injury or damage to adjacent buildings. Blasts shall be completely and carefully covered with heavy timbers or other adequate protection and shall be made only between such hours as may be designated by the City of Washington. The Contractor shall be liable for all injuries or deaths of persons or damages to property caused by blasting or explosives.

b. Measurement: All Class "B" Excavation shall be measured in place by the cubic yard. No loose, shaken or previously blasted rock will be allowed as Class "B" Excavation, nor shall any excavation exterior to the maximum limits of measurement be allowed.

3. Pipe Laying

A. General: Laying of the pipe shall be commenced immediately after the excavation is started, and the Contractor must use every means at his command to keep pipe laying closely behind the trenching. The City of Washington may stop the trenching when, in their opinion; the trench is open too far in advance of the pipe laying operation. The Contractor may lay pipe in the best manner adapted to securing speed and good results. It shall, however, be in accordance with the manufacturer's instructions and recommendations, and in a manner that

will not damage the pipe.

B. Thrust Blocking: Lines shall be thrust blocked at bends, tees, and hydrants to prevent movement of lines under pressure. The concrete blocking shall be placed between solid ground and the fitting to be anchored in such a manner that the pipe and fitting joints will be accessible for repairs. Thrust blocks shall be constructed in accordance with the following table.

Square Feet of Thrust Block Area Received for Tee or In-Line Valve
Min. Thrust Block Bearing to be 2 sq. ft.

Pipe Size	Tee or Dead End	90°Elbow	45° Elbow	22 ½" Elbow	Gate Valve
2"	Min.	Min.	Min.	Min.	Min.
4"	Min.	Min.	Min.	Min.	Min.
6"	Min.	Min.	Min.	Min.	Min.
8"	2' x 2'3"	2'8" x 2'8"	Min.	Min.	2'3" x 2'3"
10"	2'10" x 2'10"	3'6" x 3'6"	2'6" x 2'6"	Min.	2'10" x 2'10"
12"	3'6" x 3'6"	4' x 4'	3' x 3'	2'6" x 2'6"	3'6" x 3'6"

C. Laying: Damaged or unsound pipe or fittings will be rejected. Pipe shall be laid with bells facing in the direction of laying. Joints shall be made as specified above. Before joining the pipe, all lumps, blisters, excess coating material, and any grease or oil shall be removed from gaskets and the bell and spigot ends of the pipes.

D. Pipe Bending: Pipe shall be laid in a flat bottom trench with backfill material approved by the City of Washington deposited into the trench uniformly at both sides of the pipeline for the full width of the trench, up to the horizontal diameter of the pipeline.

4. Backfilling for Trenches

A. General: When the pipe is laid, the Contractor shall backfill under and around the pipe until the pipe is covered with sufficient material to hold the pipe in position when firmly tamped. The remainder of the trench shall then be carefully backfilled simultaneously on both sides of the pipe. Broken concrete or pavement, blasted rock and large boulders shall not be used as backfill materials. Any trenches improperly backfilled, or where settlement occurs shall be repaired as directed by the City of Washington. The ground shall be graded to a reasonable uniformity and the required amount of mounding over the trenches left in a uniform and neat condition. Before final acceptance is made, the Contractor shall travel the line with the City of Washington and any settled places shall be repaired as directed by the City of Washington. It is the intent of these Specifications to secure a condition where no further settlement of trenches will occur after backfilling is completed.

B. Backfilling for Trenches in Unpaved Areas: The entire backfill for trenches in areas other than areas to be paved as indicated in the approved plans shall be repaired as directed by the City of Washington. It is the intent of these Specifications to secure a condition where no further settlement of trenches will occur after backfilling is completed.

C. Backfill in Paved Areas: In areas of existing or proposed pavement or rock surfaces, the entire backfill shall consist of well-graded one (1) inch minus crushed limestone. The backfill material shall be compacted by an acceptable method to insure that no settlement of the completed backfill will occur. All areas of existing pavement damaged during construction shall be repaved with two (2) inches of Type C asphalt pavement and installed in accordance with the latest edition of the Missouri Standard Specifications for Highway Construction. Edges of the existing pavement shall be neatly cut in a straight line, removing all damaged pavement, prior to repaving.

D. Responsibility of Contractor for Backfill Settlement: The Contractor shall be responsible for the satisfactory compaction of backfill material described. If any trenches or other excavation are found to have settled, they shall be immediately reworked by the Contractor and restored to the specified grades. In addition, the Contractor shall be responsible for all damage or damages which might result from settlement of backfill made by him of the fulfillment of his contract within and during the period of one (1) year from and after the date of final acceptance thereof by the City of Washington.

E. Finish Grading: The finishing of side slopes, cuts, and fills shall be reasonably smooth uniform surfaces that will merge with the adjacent terrain without noticeable break.

F. Protection of Existing Sewers, Structures, or Utilities: Where new lines approach, cross, connect to, or run parallel to existing sewer, structures, or other utilities, the Contractor shall be held completely responsible for protecting, preserving, and otherwise maintaining existing improvements during construction of the new lines. Any damage inflicted must be promptly repaired to the satisfaction of the City of Washington. Costs involved for any and all repairs shall be at the Contractor's expense.

G. Testing Waterlines: All newly laid lines shall be tested before being placed in service. Trenches may be backfilled as the pipe is laid; or where practicable, trenches or bell holes may be left open for visual inspection during tests. Prior to making tests, all air shall be expelled from the pipe. If hydrants or blow-offs are not available at high points of the lines, suitable taps shall be provided at such points.

A one-hour hydrostatic test shall be made on the pipeline between valves or temporary plugs at a test pressure of at least fifty (50) percent in excess or normal operating pressure. Any open trench or bell holes may over dry joints and may be backfilled following this test. Where trenches have been backfilled prior to making the test, any leaks evident at the surface shall be remade and retested. All pipes, fittings, valves, hydrants, and other materials found defective under this test should be removed and replaced.

After hydrostatic tests have been satisfactorily completed, a two (2) hour leakage test shall be made on the pipeline valves or temporary plugs at a constant test pressure of seventy-five (75) pounds per square inch. Leakage in the test system shall be measured through a meter or approved measuring device. The allowable leakage shall not be greater than ten (10) gallons per 24-hour day per mile of pipe per inch nominal diameter of pipe. Should tests disclose leakage greater than the allowable amount, locate and repair defective joint(s) until the leakage is within the specified allowance.

5. Water Mains Near Sewers

A. Parallel installation: Water mains shall be laid at least ten feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten-foot separation, the department may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer and on either case, at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. In areas where the recommended separations cannot be obtained, either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing.

B. Crossings: Water mains crossing sewers shall be laid to provide a minimum vertical clear distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. At crossings, the full length of water pipe shall be located so both joints will be as far from the sewer as possible but in no case less than ten feet. Special structural support for the water and sewer pipes may be required. In areas where the recommended separations cannot be obtained either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing that extends no less than ten feet on both sides of the crossing.

C. Unusual Conditions: Where conditions prevent the minimum vertical separation set forth above from being maintained, or when it is necessary for the water main to pass under a sewer or drain, the water main shall be laid with mechanical joint cast iron pipe and the cast iron pipe shall extend off each side of the crossing to a distance from the sewer of at least ten (10) feet. In making such a crossing, a full length of water main pipe must be centered over or under the sewer to be crossed, so that the joints will be equi-distant from the sewer and as remote therefrom as possible. The sewer line must also be constructed of cast iron pipe with slip-on, leaded, or mechanical joints until the normal distance from the sewer line to the water main is at least ten (10) feet. Where a water main must cross under a sewer, a vertical separation of eighteen (18) inches between the bottom of the sewer and the top of the water main shall be maintained, with adequate support, especially for the larger sized sewer line to prevent them from setting on and breaking the water main. The sewer shall be constructed of cast iron pipe for a distance of ten (10) feet on either side of the crossing, or other suitable protection as approved by the Division of Health shall be provided. Where these conditions cannot be met, the Division of Health shall be consulted as to the precautions to be taken to protect the public water supply.

D. Sewer Manholes: No water pipe shall pass through, or come into contact with, any part of the sewer or sewer manhole.

6. Disinfecting Water Lines

A. General: The interior of all pipe, fittings, and other accessories shall be kept free as possible from dirt and foreign matter at all times.

Every precaution shall be used to protect the pipe against the entrance of foreign material before the pipe is placed in the new line. At the close of the day's work or whenever the workmen are absent from the job, the end of the last laid section of pipe shall be plugged, capped or otherwise tightly closed to prevent the entry of foreign material of any nature. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the City of Washington may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end, and left there until the connection is to be made to the adjacent pipe.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the City of Washington. Joints of pipe in the trench shall be made before the work is stopped. The provision shall apply during the noon hour as well as overnight.

B. Flushing and Sterilizing Completed Pipelines: Sterilizing of the completed line shall be done in a manner approved and recommended by the Missouri Division of Health.

Prior to chlorination, the main shall be flushed as thoroughly as possible with the water pressure and outlets available. Flushing shall be done after the pressure tests are made. It must be understood that such flushing removes only the lighter solids and cannot be relied upon to remove heavy material allowed to get into the main during laying.

Unless extreme care and thorough inspection is practiced during the laying of water mains, small stones, pieces of concrete, particles of metal, or other foreign material may gain access to mains newly laid. If it is believed that such foreign material may be in the main, it shall be thoroughly flushed and valves carefully inspected after flushing to see that the entire valve operating mechanism is in good condition.

Subsequent to flushing, the following procedure shall be followed in disinfecting the water mains.

i. Close off section of distribution system that is to be disinfected.

ii. Prepare one (1) percent chlorine solution as shown in the following table:

Product	Amount of Compound	Quantity of Water to Add to make <u>1% Solution</u>
High Test Calcium Hypo-Chlorite (65-70% Chlorine, HTH Parachloron, etc.)	1 lb.	7.5 gal.
Chlorinated Lime (32-35% Chlorine)	2 lbs.	7.5 gal.
Liquid Laundry		

Bleach (Purex or Chlorox	1 gal.	4.25 gal.

iii. The amount of chlorine required per one hundred (100) feet length of various pipe sizes is as shown in the following table:

Pipe Size (in)	(gal)	Volumeof 100 ft. Length 100% Chlorine (lb.)	Amount Required to Give 25 ppm Chlorine 1% Chlorine/Water (gal.)
2	16.4	0.0034	1/24
4	65.3	0.0135	1/6
6	146.5	0.0305	3/8
8	261.0	0.054	2/3
10	408.0	0.085	1
12	588.7	0.123	1 ½

iv. Introduce the chlorine solution with a positive displacement type pump at the same point where the water will be introduced into the section to be disinfected.

v. Fill the pipe slowly and be sure not to trap any air in the pipe. Close the section off that is to be disinfected when the pipe is full and under slight pressure. The solution should be allowed to remain in the pipe for twenty-four (24) hours.

NOTE: The detention time may be cut to three (3) hours, provided a one-hundred (100) ppm chlorine solution is used in place of the 25 ppm chlorine solution.

vi. All valves or other appurtenances in the line being disinfected should be operated while the system is being filled with the chlorine solution.

Following sterilizing, all treated water shall be thoroughly flushed from the newly laid pipeline at its extremities until the replacement water throughout its length shall, upon test, be proved comparable to the quality of water approved by the Public Health Authority having jurisdiction. The Contractor or his Representative shall arrange for any bacteriological testing of water samples that may be required. This quality of water delivered by the new main should continue for a period of at least two (2) full days, as demonstrated by laboratory examination of samples taken from a tap located and installed in such a way as to prevent outside contamination. Samples should never be taken from an unsterilized hose or from a hydrant, because such samples seldom meet current bacteriological standards.

Should the initial treatment fail to result in the condition specified in the preceding paragraph, the sterilization procedure shall be repeated until such results are obtained.

7. Cleaning of the Grounds

During the progress of the work, the Contractor shall remove and properly dispose of all debris and waste material. Upon completion and acceptance of the work, remove from the property of the City of

Washington all equipment and facilities and unused materials provided by him in connection with the work and leave the grounds in a clean and orderly condition.

8. Restoration of Disturbed Area

Any and all areas that are disturbed as a result of construction shall be restored to an “as good or better” condition as existed prior to being disturbed.

SECTION 02400
GRAVITY SEWERS

1. Materials

   A. PVC Solid Wall Sewer Pipe: Pipe and fittings under these Specifications shall be PVC solid wall pipe with bell and spigot gasketed joints, manufactured of materials and methods meeting the tests set forth in the latest revision of ASTM D-3034 and ASTM D-3212. PVC sewer pipe shall have a minimum standard dimension ratio of 26.

2. Underground Pipe Construction

   Underground pipe construction shall be in accordance with the recommended practice as outlined by the pipe manufacturer.

   All excavations shall be made to such depths and widths as will give ample room for building all structures, sewers, and appurtenances as detailed on the approved plans.

   Clearing and grubbing the site of work, excavation of earth or other materials, sheeting and bracing, pumping and drainage, backfilling, rough grading, and cleaning up shall all be done as specified. In addition, all work maintaining or replacing existing fences, roadways, drives, lawn, or structures disturbed by the work, safety precautions and other miscellaneous general work not specified under specific items is to be included in the work done under this section.

3. Sewer Pipes

   All sewer pipe shall be laid accurately to the line and grades indicated on the approved plans. The trench excavation shall be of sufficient width to properly construct the joints and to allow for inspection of proper bedding of the pipe. In all cases, the bottom quadrant of the pipe trench should be carefully shaped at proper intervals so that no part of the load is supported by the pipe bells. The full load should rest on the barrel of the pipe.

   To assure stable pipe bedding, mechanical excavation should be made four (4) inches below the bottom of the pipe grade. A layer of compacted granular material at least four (4) inches thick shall be provided to stabilize the trench bottom.

   The grades to which all sewer lines are laid shall be accurately controlled, providing grade stakes and batter board at twenty-five (25) foot intervals and checking invert elevations with a grade rod from an established grade line.

   A laser beam may be used to attain property alignment of sewer pipe during construction. However, if such a device is used, a blower of sufficient capacity to prevent refraction of the beam by fumes from joint lubricant must be used.

   No pipe shall be installed in the trench until the bottom of the trench has been properly shaped and its conditions, line, and grade has been approved by the City of Union.

All sewers must be laid in a straight line so that a light can be seen from one end to the other. Pipe shall be laid with the spigot end downstream entering the bell to full depth, and in such manner as not to drag earth into the joints. Pipe sections shall be fitted together and matched so that, when laid, they will form a sewer with a smooth and uniform invert. Installation shall be in accordance with manufacturer's recommendations.

Wherever obstructions are encountered during the progress of the work and interfere to such an extent that an alteration in the Plan is required, the City of Union shall have the authority to change the approved plans and order a deviation from the line and grade or arrange with the City of Union the structures for the removal, relocation, or reconstruction of the obstructions.

4. Cutting and Trenching Excavation

If local conditions permit their reuse, all surface materials suitable for reuse in restoring the surface shall be kept separate from the general excavation material.

All excavated material unsuitable for backfill shall be removed and disposed of off the site, by and at the expense of the Contractor.

All excavated material shall be piled in a manner that will not endanger the work and that will not avoid obstructing walks and driveways. Ditches shall be kept clear or other satisfactory provisions made for drainage.

All excavations shall be made to such depths and widths as detailed on the approved plans or as embodied in the Specifications or as will give ample room for carrying on the required construction operations.

No excavated trench shall be wider than one and four-tenths (1 4/10) times the pipe diameter in inches plus twelve (12) inches (width = 1.4d" + 12") or two (2) feet wide or as designated by the engineer.

Granular backfill material shall be tamped into the trench uniformly on both sides of the pipeline for the full width of the trench, up to the horizontal diameter of the pipeline.

No large rocks shall be allowed in contact with the pipe either in the bed or the backfill. Large rocks occurring in the bed shall be removed and the resulting hole filled with gravel.

Bell holes shall be of ample depth to permit the barrel of the pipe totally flat on the trench bottoms, but they shall not be larger than necessary for properly making the joint.

5. Trench Excavation Classifications

All excavation shall consist of two (2) classifications: Class "A" and Class "B"

A. Class "A" Excavation: Class "A" Excavation shall consist of all other materials not to be mentioned in Class "B". The decisions of the Consultants shall be final in the determination of the proper classification.

B. Class “B” Excavation: Any materials shall be considered Class “B” excavation, which, in the opinion of the Consultant cannot be excavated by any process other than drilling and blasting or drilling and wedging. The classification shall not be extended to include the materials, which can be removed by other means, but which, for reasons of economy in drilling and wedging. Such excavation shall include detached pieces of rock or boulders one (1) cubic yard or more in contents and masses of solid, well-defined ledge of stone or masses or rock, slate, shale, or soapstone and other similar substances. Class “B” Excavation shall be stripped for measurement if sections of such length as the Consultant may direct and no rock excavated or blasted before such measurements will be allowed. Stripping shall mean the removal of all other materials so as to expose the surface of the rock.

i. Explosives: Explosives shall only be used of such character and strength and in such manner as may be permitted by the City of Union. All necessary precautions shall be taken to prevent accidents and injury or damage to adjacent buildings. Blasts shall be completely and carefully covered with heavy timbers or other adequate protection and shall be made only between such hours as may be designated by the City of Union. The Contractor shall be liable for all injuries or deaths of persons or damages to property caused by blasting or explosives.

ii. Measurement: All Class “B” Excavations shall be measured in place by the cubic yard. No loose, shaken or previously blasted rock will be allowed as Class “B” Excavation, nor shall any excavation exterior to the maximum of measurements be allowed.

6. <u>Sheeting and Bracing</u>

Furnish, put in place, and maintain such sheeting, braces, rangers, and other timbering as may be required to support the sides of the excavation and to prevent any movement which could in any way injure the sewers, diminish the necessary width of the excavation or otherwise injure or delay the work or endanger adjacent pavements, buildings, sewers, pipes, drains, conduits or other structures, or the lives of workmen employed thereon.

The engineer may direct that sheeting in the trench be cut off at any specified elevation and in no case without permission shall timber be left in the ground above and elevation eighteen (18) inches below the surface of the ground.

All timber, which may not be left in place under the foregoing provisions of this Specification, shall be removed in such manner as not to endanger adjacent pavements, structures or property, or to cause movement of the pipe or endanger the structure built in the excavation from which the timber of sheeting is being removed or adjacent thereto. All voids left by withdrawal of sheeting shall be immediately refilled with sand or fine earth by ramming with tools especially adapted to that purpose, by watering, or otherwise as may be

directed by the engineer.

7. Laying Pipe

The pipelines shall be constructed of such sizes and laid accurately to such lines and grade as are shown in the approved plans. Pipe material shall meet the requirements of the Material Specifications. Branches, fittings, and specials shall be provided, and when not to be immediately used shall be closed with earthenware or pre-cast concrete stoppers sealed in place with bituminous mastic. When immediate use is to be made of them, they may be closed with a plywood stopper. The sewer at the end of the days' laying shall be closed with dirt-tight temporary stopper.

The interior of the sewers shall, as the work progresses, be cleared of all dirt, cement and superfluous materials of every description. On all diameter sewer, an approved swab or drag shall be kept in the pipeline and pulled forward past each joint immediately after its completion.

Variance from established line and grade shall not exceed one-half (1/2) inch, provided that any such variation does not result in a level or reverse sloping invert; provided also, that variation in the invert elevation between adjoining ends of pipe due to non-concentricity of joining surface and pipe interior surfaces, does not exceed one-fourth (1/4) inch maximum.

Unless otherwise permitted, at least four (4) finished joints shall be left exposed for inspection throughout the working day, and any and all sections of pipe laid shall be made accessible for inspection at any time while the work is progressing.

Pipe shall not be laid in water. No walking on or walking over the pipe will be permitted after they are laid except as may be necessary for backfilling and tamping.

Pipe shall be laid true to line and grade shown in the approved plans and shall be firmly supported for its entire length when laid in trench.

8. Backfilling for Trenches

A. General: When the pipe is laid, the Contractor shall backfill under and around the pipe as specified in "Pipe Bedding". The remainder of the trench shall then be carefully backfilled simultaneously on both sides of the pipe. Broken concrete or pavement, blasted rock and large boulders shall not be used as backfill materials. Any trenches improperly backfilled, or where settlement occurs, shall be repaired as directed by the engineer.

B. Backfill in Paved Areas: In areas of existing or proposed pavement or rock surfaces, the entire backfill shall consist of well-graded one (1) inch minus crushed limestone. The backfill material shall be compacted to ninety (90) percent of the Modified Proctor density by an acceptable method to ensure that no pavement settlement of the

completed backfill will occur. All areas of existing pavement damaged during construction shall be repaved with three (3) inches of Type C asphaltic pavement and installed in accordance with the latest edition of the Missouri Standard Specifications for Highway Construction. Edges of the existing pavement shall be neatly cut in a straight line, removing all damaged pavement prior to repaving.

C. Backfill in Areas that are not Paved: The entire backfill for trenches in these areas shall be compacted to eighty-five (85) percent of the Modified Proctor density as directed by the engineer. It is the intent of these Specifications to secure a condition where no further settlement of trenches will occur after backfilling is completed.

D. Compaction: Care shall be exercised not to disturb pipe when placing backfill. All backfill or trenches shall be placed in uncompacted lifts not to exceed eight (8) inches in thickness, and each lift shall be compacted in a manner approved by the engineer.

E. Responsibility of Contractor for Backfill Settlement: The Contractor shall be responsible for the satisfactory compaction of backfill material described. If any trenches or other excavation are found to have settled, they shall be immediately reworked by the Contractor and restored to the specified grades. In addition, the Contractor shall be responsible for all damage or damages which might result from settlement or backfill made by him on the fulfillment of his Contract within and during the period of one (1) year from and after the date of final acceptance thereof by the City of Union.

F. Finish Grading: The finishing of side slopes, cuts, and fills shall be reasonably smooth, uniform surfaces that will merge with the adjacent terrain without noticeable break. Finishing shall be done in accordance with grades shown on the approved plans and without variations that are readily discernible.

9. Testing of Sewers

A. General: After construction and backfilling are completed and before any services are connected to the sewers, the completed lines shall be tested for leaks and visually checked for straightness of line and cracked pipe. If any deficiencies in line or grade are found which will be determined to the proper functioning of the sewer, the deficiencies shall be corrected. Any damaged or cracked pipe shall be excavated and relayed in a manner satisfactory to the engineer. Any section of sewer which is found to be leaking in excess of the allowable quantity shall be repaired.

B. Acceptance Tests: Each reach of sewer shall meet the requirements of the following acceptance tests. All defects shall be repaired to the satisfaction of the engineer.

i. Lamping: Each section of sewer line between manholes shall be straight and uniformly graded. Each such section will be lamped. Lamping will be performed by the City of Union.

ii. Concrete Sewer Manholes shall be tested by the Negative Air Pressure.

iii. Installation Acceptance of Plastic Gravity Sewer Lines shall be tested by using Low-Pressure Air.

10. Sewers Near Water Mains

A. Horizontal Separation: Whenever possible, sanitary sewers and manholes shall be located at least ten (10) feet, horizontally, from any water main. When local conditions prevent a lateral separation of ten (10) feet, a sewer may be laid closer than ten (10) feet to a water main, provided that the water main is at least eighteen (18) inches above the top of the sewer. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both the water main and sewer must be constructed of mechanical slip-on joint pipe and should be pressure-tested to assure water-tightness before backfilling.

B. Vertical Separation: Whenever sanitary sewers or house sewers must cross water mains, the sewer shall be laid at such an elevation that the bottom of the water main is eighteen (18) inches above the top of the drain or sewer. A full length of water main pipe shall be centered over the sewer line to be crossed as that the joints will be equally distant from the sewer and as remote therefrom as possible. This vertical separation shall be maintained for the portion of the water main located within ten (10) feet, horizontally, of any sewer or drain it crosses.

C. Unusual Conditions: Where conditions prevent the minimum vertical separation set forth above from being maintained, or when it is necessary for the water main to pass under a sewer or drain, the water main shall be laid with mechanical joint cast-iron pipe, and the cast-iron pipe shall extend on each side of the crossing to a distance from the sewer of at least ten (10) feet. In making such a crossing, a full length of water main pipe must be centered over or under the sewer to be crossed, so that the joints will be equi-distant from the sewer and as remote therefrom as possible. The sewer line must also be constructed of cast-iron pipe with slip-on joints until the normal distance from the sewer line to the water main is at least ten (10) feet.

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.
3. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.
6. Insert agenda items.

1.6 INFORMATIONAL SUBMITTALS

A. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

B. Predemolition Photographs or Video: Submit before Work begins.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

    a. Cameras in demolition area.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

F. Storage or sale of removed items or materials on-site is not permitted.

G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1. Comply with requirements specified in Section 013233 "Photographic Documentation."
2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain[fire watch and] portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section <Insert Section number> "<Insert Section title>" for new roofing requirements.

1. Remove existing roof membrane, flashings, copings, and roof accessories.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 02500
CONCRETE SIDEWALK

PART 1 -- GENERAL

SUMMARY

A. This section includes all work related to the installation of new concrete sidewalk or replacement of existing.

B. Method of Measurement. Concrete sidewalk will be measured to the nearest square foot.

C. Basis of Payment. The quantities of complete and accepted work, measured as provided, shall be paid for at contract unit price. Prices shall be full compensation for all materials, equipment, and labor, required to complete the work.

REFERENCES

A. "Missouri Standard Specifications for Highway Construction" (MSSHC), Section 608.

SUBMITTALS

A. Submit certification, signed by contractor and supplier, that materials meet specification requirements.

PART 2 -- PRODUCTS

MATERIALS

A. Aggregate Base

Locally available inch-minus material shall be used for the aggregate base. The aggregate shall be free of soil and other foreign materials. Material to be supplied and placed by the contractor.

B. Portland Cement Concrete

Class B Concrete shall be used for sidewalks in accordance with MSSHC, Section 608.

C. Pre-formed Fiber Expansion Joint Material

Joint Materials used shall be in accordance with MSSHC, 2004, Section 608.

FORMS

Forms shall be metal or sound dressed lumber, straight, and free from warp, of sufficient strength to resist springing during construction. Flexible forms will be required for all curved form lines, except that straight steel form sections 10 feet or less may be used for radii greater than 200 feet.

PART 3 -- EXECUTION

DEMOLITION

A. Any existing sidewalk to be replaced shall be removed and disposed of by the contractor.

CONSTRUCTION

A. A minimum of 4 inches of compacted aggregate base shall be provided by the contractor under the all new sidewalks. The aggregate base shall be compacted to a minimum of 95% of the standard proctor density.

B. Forms shall be of a height equal to the full depth of the sidewalk. The forms shall be thoroughly cleaned, well oiled, securely staked, braced, and held to the required line and grade. Slip form methods may be used, if approved by the Owner Engineer.

C. Joints

1. Contraction joints shall be placed every five feet. They may be hand tooled or saw cut.

2. Isolation/expansion joints shall be placed every twenty feet and against all existing or separate structures. These joints shall be filled with an approved preformed fiber material.

D. Concrete sidewalks shall have a minimum thickness of 4 inches. Concrete shall be placed on the prepared sub-grade, consolidated, and struck off to the required thickness. Concrete shall be tamped or vibrated sufficiently to eliminate all voids and to bring mortar to surface, after which the surface shall be finished smooth and even.

E. After concrete has set sufficiently, the forms shall be removed, and where

necessary, the contractor shall backfill adjacent to the newly placed concrete with suitable material, compacted and finished to a suitable manner. All disturbed grass areas shall be reseeded and strawed.

PROTECTION OF CONCRETE

A. Concrete must be protected from weather, as specified in MSSHC, Section 608.

B. The contractor is responsible for protecting the concrete.

INSPECTION

A. No concrete shall be placed until the aggregate base, forms and adjacent edges are approved by the Engineer.

B. Inspection of work shall be performed by the Engineer or his representative as required.

END OF SECTION 02500

SECTION 02600
RIP-RAP SLOPE PROTECTION

PART 1 – GENERAL

DESCRIPTION

This work shall consist of slope or bank protection of the type specified in the plans, constructed at locations shown on the plans or as directed by the engineer.

MATERIAL

Acceptance of quality and size of material will be made by visual inspection at the job site.

Stone for light stone revetment shall be sound, durable and free from cracks and other structural defects that would cause the revetment to deteriorate. The stone shall not contain any soapstone, shale or other material easily disintegrated. The stone shall be in blocks at least 7 inches thick perpendicular to the slope and shall have approximately rectangular faces 7 inches wide or more.

CONSTRUCTION REQUIREMENTS

Unless otherwise approved, the slopes on which revetment are to be placed shall be in accordance with section shown on the plans. The slopes shall be compacted to a uniform density as required for adjacent material. Each stone or block shall be laid perpendicular to the slope, shall be firmly bedded against the slope and against adjoining stones or blocks, and shall be laid with well broken joints. After revetment has been placed, the voids shall be filled with spalls or small stones in such a manner that all revetment stones or blocks are tightly wedged. The finished surface shall present a uniform appearance true to line, grade and section.

END OF SECTION 02600

SECTION 02700
FINISH GRADING AND SEEDING

PART 1 - GENERAL

SCOPE

The Work shall include the furnishing of all labor, materials, tools, equipment, supervision and services necessary for and incidental to the complete finishing and seeding of areas disturbed by construction and lawn area, including preparation of soil, planting, mulching, watering and the proper disposal of any excess earth or debris, all in accordance with accompanying Plans and these Specifications.

SEEDING

A. MATERIALS.

1. Commercial fertilizer shall be a complete inorganic fertilizer, containing in available form by weight, a minimum of 12% nitrogen, 12% phosphoric acid and 12% potash, and shall be applied to all areas designated.

2. Agricultural limestone shall be finely ground limestone rock, containing a minimum of a combined total of calcium and magnesium carbonate equivalent from 85% to 90%. All the material shall pass a 3/16 inch screen. Approximately 90% shall pass a #8 screen and approximately 15% to 20% shall pass a #100 screen. Said limestone shall be applied to all areas designated in Section 4.

3. Water used in this Work will be furnished by the Contractor and will be suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment required for the Work shall be furnished by the Contractor.

4. Seed shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act. All seed shall be furnished in sealed standard containers unless exception is granted in writing by the Owner's Representative. Seed which has become wet, moldy or otherwise damaged in transit or in storage will not be acceptable. The seed mixture applied per acre shall be as follows: SEE PLANS

TIME OF PLANTING

No seeding shall be done except in favorable weather conditions during the planting seasons as follows:

Spring Planting Season – March 1 thru June 1
Fall Planting Season – August 15 thru October 1

At the option and on the full responsibility of the Contractor, planting operations may be conducted under unseasonable conditions subject to the approval of the Owner's Representative.

LOCATION OF AREAS TO BE SEEDED

Areas to be seeded shall include all areas disturbed by excavation and construction procedures necessary to carry out all the Work under this Contract. The only exceptions shall be proposed streets.

PREPARATION FOR SEEDING

A. TILLAGE. The final grade for areas to be seeded is shown on the Contract Drawings. High and low spots are to be worked out and the seed bed prepared as follows:

Scarify area to a depth of three inches by use of a disk, harrow or any multi-purpose tractor-drawn tool approved by the Consultant.

Eliminate surface irregularities by use of weighted drag, making passes at 90º to each other.

Re-disk and harrow to a depth of three inches, then chain drag, until the soil is acceptable to the Owner's Representative.

Portions not readily worked by machine will be worked by hand.

All sticks, stones, weeds or their roots and other rubbish shall be removed.

No grading shall be done when the soil is in muddy or frozen conditions.

B. APPLYING FERTILIZER. The previously described limestone shall be applied in all areas by an approved spreader at the rate of 10,000 pounds per acre.

Commercial fertilizer shall be applied in all areas at the rate of 750 pounds of effective material per acre to the finished surface before seeding. It shall be thoroughly raked into the top two inches of the surface before sowing the seed.

PLANTING SEED, MATTING, AND MULCHING

A. GENERAL. A method of sowing satisfactory to the Consultant shall be employed, making use of approved mechanical power-drawn drills or seeders, or other approved methods. When drills are used, provisions shall be made by markers or other means to assure that the successive seeded strips will overlap or be separated by a space no greater than the space between the rows planted by the equipment being used. When delays in operations carry the Work beyond the most favorable planting season for the species designated or when conditions are such, by reason of drought, high winds, excessive moisture or other factors, that satisfactory results are not likely to be obtained, the Work shall be suspended, and Work shall be resumed only when conditions are favorable again or when approved alternate or corrective measures and procedures have been put into effect. If inspection during seeding operations or after there is a shown of green indicates that strips wider than the space between the row's plants have been left, or other areas skipped, the Owner may require the sowing of additional seed on these areas. Seed mixed in proportions specified herein shall be broadcast by approved sowing equipment at the rate of 210 pounds per acre. The seed shall be uniformly distributed over the designated areas. Half the seed shall be sown with the sowing moving at right angles to the first sowing. The seed shall be covered to an average depth of ½ inch by means of a rush harrow, spike-tooth harrow, chain harrow, cultipaker, or their approved device.

B. MULCH. All bank areas with a grade steeper than one vertical to eight horizontal shall be mulched. Mulch material for seeded areas shall consist of threshed straw or oats, wheat, barley or rye. Excessive quantities of straw containing matured seed of noxious weeds or other species detrimental to over seeding shall no be accepted. Straw which is fresh and excessively brittle or which is in an advanced stage of decomposition that will smother or retard growth of grass is not acceptable.

C. APPLYING MULCH. The mulch shall be spread uniformly in a continuous blanket; using two tons per acre after the operation specified for planting seed are completed. If the mulching material is too long and brittle for proper securing in the surface soil, it shall be cut by an ensilage cutter or other equipment to lengths of not more than eight inches and watered as needed before spreading, assure proper securing of mulch into the soil.

The mulch shall be spread by hand or by use of a modified grain combine with straw spreader attachment or other suitable equipment. Mulching shall be started at the windward side of relatively flat areas, or at the upper part of a steep slope, and shall continue uniformly until the area is completely covered.

D. COMPACTING MULCH. Immediately following the spreading of the mulch, the material shall be anchored to the soil by a V-Type wheel landpacker, a disk harrow set to cut only slightly, a rotary hoe run backwards or other suitable equipment which will secure the mulch firmly to the ground to form a soil-binding mulch and prevent loss of bunching by wind. The number of passes over the mulch needed to secure it firmly to the soil shall be as determined by the Consultant, but shall in no case exceed three passes. On slopes where machinery cannot be used, mulch shall be retained in place by a shallow covering of earth by pressing into the soil at six inch intervals with a spade or other approved tool, by twine, stakes, or brush or by other suitable means which will not be detrimental to subsequent maintenance.

E. TURF MAT. Turf mat shall be placed according to manufacturer's recommendations located in all areas shown on the plans.

ESTABLISHMENT OF SEEDED AREAS

A. GENERAL. The grounds will be inspected for acceptable grass coverage. Lawn areas will be acceptable when growing in good conditions, and no area more than ½ of one percent of the total area shall be bare, of which no single area shall be more than four square feet in area. Any area larger than this shall not be acceptable and shall be reseeded as prescribed above in the planting season immediately following.

B. RESEEDING. Areas that require reseeding will be designated by the inspection of the Owner and the Contractor prior to the period specified by reseeding. Reseeding shall be with the seed and/or mulch and at the rate specified and shall be drilled in a manner which will cause a minimum of disturbance to the existing stand of grass and at an angle of not less than fifteen degrees from the direction of the rows of prior seeding.

LAWN MAINTENANCE

A. Areas for four square feet or more that do not show definite growth and establishment shall be reseeded by the Contractor.

B. Areas shall be adequately protected against damage of any kind. Areas that have been damaged or washed out shall be promptly renewed.

C. The maintenance responsibility shall not cease until all the Work outlined under this section of the Specifications is satisfactorily completed.

CLEANING OF THE GROUNDS

During the progress of the Work, remove and properly dispose of all debris and waste material. Upon completion and acceptance of the Work, remove from the property of the Owner all equipment and facilities and unused materials provided by him in connection with the Work and leave the grounds in a clean and orderly condition.

FINAL ACCEPTANCE

The Work under the Section of the Specifications for the installation of all new grass areas shall be accepted by the Owner's Representative upon satisfactory completion of all Work, including maintenance as hereinbefore specified.

PAYMENT

The cost of the finished grading, matting and seeding shall be considered as included in and completely covered in the Contract Agreement.

END OF SECTION 02700

SECTION 02800
TRAFFIC REGULATIONS

PART 1 – GENERAL

DESCRIPTION

A. This section shall cover the traffic controls to be used during the construction.
B. Detouring of traffic for this Work will be permitted.

REFERENCE STANDARDS

A. Manual of Uniform Traffic Control Devices (MUTCD)

PART 2 – PRODUCTS

EQUIPMENT

A. Barricades and signage shall conform to the MUTCD.

PART 3 – EXECUTION

3.1 Notice of road closure shall be given to the residents and no parking signs posted on the road the day prior to commencing Work, whenever possible.

3.2 Traffic shall be re-routed and the road to remain open per the City of Union for the entire period of application and curing.

3.3 Adequate means shall be provided to protect newly constructed pavement.

3.4 The Contractor will provide barricades, which will be used to protect the Work surface from damage by traffic.

3.5 Damage to Work shall be the responsibility of the Contractor.

3.6 If damage occurs where suitable means have been made to protect the uncured surface, violators will be prosecuted and the Contractor reimbursed for the amount of the damages.

SECTION 02900
CEMENT CONCRETE PAVEMENT

PART 1 – GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section. Work shall conform to all applicable subsections of Missouri Standard Specifications for Highway Construction, Latest Edition (MSSHC) Section 502, Portland Cement Concrete Base and Pavement.

Joint layout and details shall conform to Design Criteria for the Preparation of Improvement Plans of the Saint Louis County Department of Highways and Traffic, latest edition.

SUMMARY

This Section includes exterior cement concrete pavement for the roadway.

DEFINITIONS

Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans and ground granulated blast-furnace slag.

SUBMITTALS

Product Data: For each type of manufactured material and product indicated.

Design Mixtures: Submit a mix design per MSSHC Section 501.

Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Applied finish materials.

6. Bonding agent or epoxy adhesive.

7. Joint fillers.

QUALITY CONTROL/ASSURANCE

The Contractor shall have quality control responsibility per MSSHC Section 502.11. The City shall have quality assurance responsibilities per MSSHC Section 502.12.

Installer Qualifications: An experienced installer who has completed pavement work similar in material, design and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.

Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

PART 2 - PRODUCTS

1. FORMS—shall be per MSSHC Section 502.

    a. Form Materials: Plywood, metal, metal-framed plywood or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

    b. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2. STEEL REINFORCEMENT

    a. Material for dowel bars and tie bars shall be per Design Criteria for the Preparation of Improvement Plans of the Saint Louis County Department of Highways and Traffic, latest edition, as indicated on the

project plans.

b. Bar Supports: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and dowels in place.

3. CONCRETE MATERIALS—shall be pavement concrete to comply with MSSHC Section 502.

4. CURING MATERIALS—shall be per MSSHC Section 502.6.

5. RELATED MATERIALS

   a. Material for joints shall comply with MSSHC Section 502.

6. PAVEMENT MARKINGS

   a. Pavement-Marking Paint: None required.

7. CONCRETE MIXTURES—shall comply with MSSHC Section 501.

8. CONCRETE MIXING—shall comply with MSSHC Section 501.

PART 3 – EXECUTION

EXAMINATION

Base rock will be prepared by the contractor.

PREPARATION

Base rock will be prepared by the contractor.

Contractor shall finish grade rock base. All necessary material shall be supplied by the contractor.

EDGE FORMS AND SCREED CONSTRUCTION

1. Set, brace and secure edge forms, bulkheads and intermediate screed guides for pavement to required lines, grades and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

2. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

STEEL REINFORCEMENT

Construction requirements for dowel bars and tie bars shall be per MSSHC Sections 502 and 1057.

JOINTS

General: Form construction, expansion and contraction joints and tool edgings per MSSHC Section 502, true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated. Joint layout and details shall be per Design Criteria for the Preparation of Improvement Plans of the Saint Louis County Department of Highways and Traffic, latest edition, as indicated on the project plans.

When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

1. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

    a. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.

    b. Provide tie bars at sides of pavement strips where indicated.

    c. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

    d. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

    e. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate one-half of dowel length to prevent concrete bonding to one side of joint.

2. Expansion Joints: Form expansion joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects and where indicated.

    a. Extend joint fillers full width and depth of joint.

    b. Terminate joint filler not less than 1/2 inch or more than 1 inch below

finished surface if joint sealant is indicated.

c. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.

d. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

e. Protect top edge of joint filler during concrete placement with metal, plastic or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

3. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

   a. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade or otherwise damage surface and before developing random contraction cracks.

   b. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate one-half of dowel length to prevent concrete bonding to one side of joint.

4. Edging: Tool edges of pavement, gutters, curbs and joints in concrete after initial floating with an edging tool to a 1/4-inch or 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

5. Pavement joint material shall comply with MSSHC Section 1057.

CONSTRUCTION REQUIREMENTS—shall be per MSSHC Section 502.

PAVEMENT TOLERANCES—shall be per MSSHC Section 502.

PAVEMENT MARKING

See plans.

FIELD QUALITY CONTROL

Refer to Missouri Standard Specifications for Highway Construction 2004 Section

502 for testing requirements and frequency.

REPAIRS AND PROTECTION

1. MSSHC Sections 502.11.4 Corrective Action, and 502.11.5 Dispute Resolution shall be utilized as needed.

2. Protect concrete from damage. Exclude traffic from pavement for at least seven (7) days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

3. Maintain concrete pavement free of stains, discoloration, dirt and other foreign material. Sweep concrete pavement not more than two (2) days before date scheduled for Substantial Completion inspections.

SECTION 03000
HOT-MIX ASPHALT PAVING

PART 1 – GENERAL

DEFINITIONS

Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

MoDOT: Missouri Department of Transportation.

SYSTEM DESCRIPTION

Provide hot-mix asphalt paving according to materials, workmanship and other applicable requirements of standard specifications of MoDOT.

1. Standard Specification: Missouri Standard Specifications for Highway Construction, latest edition.

2. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

SUBMITTALS

Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

Job-Mix Designs: For each job mix proposed for the work, per MSSHC Section 401.4.

Material Test Reports: For each paving material.

Material Certificates: For each paving material, signed by manufacturers.

QUALITY CONTROL/ASSURANCE

The Contractor shall have quality control responsibilities per MoDOT Specifications Section 401.8 Quality Control.

Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction with MoDOT.

Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

Regulatory Requirements: Comply with Standard Specifications of MoDOT for asphalt paving work.

Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements", unless more stringent requirements are indicated.

PROJECT CONDITIONS

Environmental Limitations: Do not apply asphalt materials on any wet surface or frozen pavement, per MSSHC Section 401.7.

PART 2 – PRODUCTS

AGGREGATES

General: Use materials and gradations that have performed satisfactorily in previous installations.

Coarse Aggregate: In accordance with Section 1002.2 of the Missouri Standard Specifications for Highway Construction, 2004 edition.

Fine Aggregate: In accordance with Section 1002.3 of the Missouri Standard Specifications for Highway Construction, 2004 edition.

Mineral Filler: In accordance with Section 1002.4 of the Missouri Standard Specifications for Highway Construction, 2004 edition.

Hydrated Lime: In accordance with Section 1002.5 of the Missouri Standard Specifications for Highway Construction, 2004 edition.

ASPHALT MATERIALS

Asphalt Binder: PG 64-22 to be used.

Tack Coat: In accordance with Section 407 of the Missouri Standard Specifications for Highway Construction, 2004 edition.

AUXILIARY MATERIALS

Sand: ASTM D 1073, Grade Nos. 2 or 3.

MIXES

Hot-mix Base Asphalt: In accordance with Section 401, gradation type Bituminous Base of the Missouri Standard Specifications for Highway

Construction, 2004 edition. Asphalt binder PG 64-22 to be used.

Hot-mix Surface Asphalt: In accordance with Section 401, gradation type BP-2 of the Missouri Standard Specifications for Highway Construction, 2004 edition. Asphalt binder PG 64-22 to be used.

PART 3 – EXECUTION

SURFACE PREPARATION

All road pavement base and sub-base work, as shown on the street cross section, shall be the responsibility of the Contractor.

HOT-MIX ASPHALT PLACING

Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section and thickness when compacted.

1. Place hot-mix asphalt surface course in a compacted 2" thick lift.

2. Spread mix at minimum temperature of 250 degrees F.

3. Regulate asphalt paver machine speed to obtain smooth, continuous surface. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

4. After first lift has been placed and rolled, place succeeding lifts and extend rolling to overlap previous lift. Complete a section of asphalt base course before placing asphalt surface course.

   Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

JOINTS

Construct joints per MSSHC Section 401.7 to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.

2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.

3. Offset transverse joints, in successive courses, a minimum of 24 inches.

4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements".

5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

6. Compact asphalt at joints to a density within 2% of specified course density.

COMPACTION

General: Begin compaction per MSSHC Section 401.7 as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 degrees F.

   Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade and smoothness. Correct lay down and rolling operations to comply with requirements.
   Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

2. Average Density: Minimum of 92% of reference maximum theoretical specific gravity according to MoDOT Section 401.7.8.

   Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

   Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

   Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

   Protection: After final rolling, do not permit vehicular traffic on pavement

until it has cooled and hardened.

Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

SURFACE TOLERANCES

The finished layers shall be substantially free from waves or irregularities and shall be true to the established crown and grade per MoDOT Section 401.10 Surface Tolerance.

SECTION 03100
PAVEMENT MARKING

PART 1 – GENERAL

DESCRIPTION

This work shall consist of furnishing, installing, maintaining and removing temporary and permanent pavement marking as shown on the plans, as specified herein or as directed by the engineer.

GENERAL

All pavement marking shall be in accordance with the latest edition of the MUTCD and the FHWA Standard Highway Signs at the time of the bid opening.

All pavement marking shall be installed in accordance with the latest edition of the Missouri Standard Specifications for Highway Construction and all manufacturers' recommendations. Manufacturer's written application or installation instructions shall be provided by the contractor to the engineer.

PAINT FOR PAVEMENT MARKING

This work shall consist of furnishing and placing pavement marking paint and drop-on glass beads at the locations shown on the plans or as directed by the engineer and in accordance with Division 1000, Material Details in the Missouri Standard Specifications of Highway Construction. When paint is specified, the contractor may use either waterborne or acrylic copolymer pavement marking paint.

PAINT APPLICATION

Paint shall be machine applied using spray guns designed and adjusted to apply paint at the required thickness and width. Paint shall be applied to a minimum wet thickness of 15 mils. (0.38mm) The wet film thickness of the applied paint shall be tested with a paint thickness gauge as directed by the engineer. Drop-on glass beads shall be mechanically applied to the wet paint directly behind the paint spray guns. Glass beads shall be applied at a rate required to meet the provisions of Section 620.2.4.1 of the Missouri Standard Specifications for Highway Construction.

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Sections:

1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture.

1. Provide documentation to indicate that no shale aggregate is to be used for exterior or interior flatwork concrete prior to mixing the batch(s) of concrete.
2. Indicate amounts of mixing water to be withheld for later addition at project site.
3. Witheld water shall not exceed 1 gallon per yard.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

1.3 INFORMATIONAL SUBMITTALS

A. Material certificates.

B. Material test reports.

C. Floor surface flatness and levelness measurements.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete,"
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

F. Preinstallation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
1. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice.

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I, gray . Supplement with the following:

    a. Fly Ash: ASTM C 618, Class C, 15% of cementitious material weight.

B. Normal-Weight Aggregates: ASTM C 33, graded.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
3. Shale Aggregates: There shall be no shale aggregate used in the exterior or interior flatwork concrete. Provide proper documentation to indicate no shale aggregate will be included in the flatwork mix.

C. Water: ASTM C 94/C 94M and potable.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
7. Interior concrete floor slab on grade and upper level slabs shall receive a vapor emissions control admixture at manufacturer's recommended dosage rate. Admixture shall be deducted from volume of water.
    a. Products:
        1. Concure Systems Admixture
        2. Barrier One International Admixture
        3. Specialty Products Group Vapor Lock 20/20

2.5 WATERSTOPS

A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

B. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

C. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch (10 by 19 mm).

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Products:

a. Stego Industries, LLC; Stego Wrap 15 mil
b. W.R. Meadows; W.R. Meadows Perminator 15 mil
c. Reef Industries, Inc.; Griffolyn 15 mil

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

2.9 CONCRETE MIXTURES

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Use 15% fly ash to reduce the total amount of portland cement.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

D. Proportion normal-weight concrete mixture as indicated on the structural drawings :

2.10 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

2.12 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

E. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

E. Waterstops: Install in construction joints and at other joints indicated according to manufacturer's written instructions.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Cold-Weather Placement: Comply with ACI 306.1.

D. Hot-Weather Placement: Comply with ACI 301.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities, including blow-outs.
1. Apply to concrete surfaces exposed to public view, as identified on the drawings. Use DLH Nordisk Inc., Xact2form film face plywood liner.
2. Finish should be Class A per ACI 347-04.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
1. Apply scratch finish to surfaces to receive concrete floor toppings
2. After placing slabs, finish surface to tolerances of Overall Values of FF 23 (floor flatness) and FL 17 (floor levelness) and Minimum Local Values of FF 20 and FL 15 measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system .
2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).
3. Finish surfaces to tolerances of surface to tolerances of Minimum Overall Values of FF 50 (floor flatness) and FL 29 (floor levelness) and Minimum Local Values of FF 40 and FL 25 measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

3.9 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing

operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

    a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.11 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION 033000

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Clay face brick - Full size and thin brick veneer.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry-joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.

B. Products Installed but not Furnished under This Section:

1. Steel lintels in unit masonry.
2. Steel shelf angles for supporting unit masonry.
3. Cavity wall insulation.

C. Related Requirements:

1. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
2. Section 072100 "Thermal Insulation" for cavity wall insulation.
3. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
3. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.

4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Verification: For each type and color of the following:
1. Concrete face brick.
2. Clay face brick, in the form of straps of five or more bricks.
3. Special brick shapes.
4. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
5. Weep holes and cavity vents.
6. Accessories embedded in masonry.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Material Certificates: For each type and size of the following:

1. Masonry units.

a. Include material test reports substantiating compliance with requirements.
b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
c. For exposed brick, include test report for efflorescence according to ASTM C 67.
d. For surface-coated brick, include test report for durability of surface appearance after 50 cycles of freezing and thawing according to ASTM C 67 or a list of addresses of buildings in Project's area where proposed brick has been used successfully and with a history of durability.

e. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

2. Integral water repellent used in CMUs.

3. Cementitious materials. Include name of manufacturer, brand name, and type.
4. Mortar admixtures.
5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
6. Grout mixes. Include description of type and proportions of ingredients.
7. Reinforcing bars.
8. Joint reinforcement.
9. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar[and grout]. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Build sample panels for typical exterior wall in sizes approximately 48 inches long by 48 inches high by full thickness.
2. Build sample panels facing south.
3. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
4. Clean one-half of exposed faces of panels with masonry cleaner indicated.
5. Protect approved sample panels from the elements with weather-resistant membrane.
6. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.

a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work[and will be within 20 feet vertically and horizontally of a walking surface].

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide [square-edged] [bullnose] units for outside corners unless otherwise indicated.

B. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.

2. Density Classification: Lightweight.
3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

2.5 MASONRY LINTELS

A. General: Provide one of the following:

B. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Clay Face Brick: Facing brick complying with ASTM C 216.

1. Products: Subject to compliance with requirements, provide the following:

   a. Type 1 - Black - Feldhaus 700.
   b. Type 2 - Red - Feldhaus 401.

2. Grade: SW.
3. Type: FBX.
4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 4150 psi.

5. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C 67.

6. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

7. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing according to ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet or shall have a history of successful use in Project's area.

8. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 8 inches long.
9. Color and Texture: Match Architect's samples

2.7 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Cement: ASTM C 1329/C 1329M.
1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

a. Lafarge North America Inc.; Lafarge Mortar Cement.

E. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

F. Aggregate for Grout: ASTM C 404.

G. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

a. BASF Corporation-Construction Systems; <Insert product designation>.
b. Euclid Chemical Company (The); an RPM company; Accelguard 80.

c. Grace Construction Products; W.R. Grace & Co. -- Conn.; Morset.

I. Water: Potable.

2.8 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Hot-dip galvanized carbon steel.
2. Exterior Walls: Hot-dip galvanized carbon steel.
3. Wire Size for Side Rods: 0.187-inch diameter.
4. Wire Size for Cross Rods: 0.187-inch diameter.
5. Wire Size for Veneer Ties: 0.187-inch diameter.
6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
7. Provide in lengths of not less than 10 feet[, with prefabricated corner and tee units].

C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder[or truss] type with single pair of side rods.

D. Masonry-Joint Reinforcement for Multiwythe Masonry:

1. Ladder type with one side rod at each face shell of hollow masonry units more than 4 inches wide, plus [one side rod] [two side rods] at each wythe of masonry 4 inches wide or less.
2. Tab type, either ladder or truss design, with one side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe, but with at least 5/8-inch cover on outside face.
3. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch and maximum vertical adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face. Ties have hooks or clips to engage a continuous horizontal wire in the facing wythe.

E. Masonry-Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch- diameter, hot-dip galvanized carbon-steel continuous wire.

2.9 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.

2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.

3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.

1. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long may be used for masonry constructed from solid units.
2. Where wythes [do not align] [are of different materials], use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches.

3. Wire: Fabricate from 1/4-inch- diameter, hot-dip galvanized steel wire.

D. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire.

2. Tie Section: Triangular-shaped wire tie made from 0.25-inch- diameter, wire.

E. Partition Top Anchors: 0.105-inch- thick metal plate with a 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

F. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.

1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.

G. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
2. Fabricate wire ties from 0.25-inch- diameter, hot-dip galvanized-steel wire unless otherwise indicated.

3. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.

4. Seismic Masonry-Veneer Anchors: Connector section and rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having slotted holes for inserting vertical leg of connector section. Connector section consists of a rib-stiffened, sheet metal bent plate with down-turned leg designed to fit in anchor section slot and with integral tabs designed to engage continuous wire.

a. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

1) Dur-O-Wal; a Hohmann & Barnard company; D/A 213S.
2) Hohmann & Barnard, Inc; 200/DA 213S with DA-213S.
3) Wire-Bond; .

2.10 EMBEDDED FLASHING MATERIALS

A. Flexible Flashing: Use one of the following unless otherwise indicated:

1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.

a. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

1) Du Pont; Thru-Wall Flashing.
2) Hohmann & Barnard, Inc; Flex-Flash.
3) Hyload, Inc.; Hyload Cloaked Flashing System.
4) Mortar Net USA, Ltd; Total Flash.

b. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch- thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1-1/2 inches from edge.

1) Color: Gray.

c. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

B. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
4. Where flashing is fully concealed, use flexible flashing.

C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

D. Termination Bars for Flexible Flashing: Aluminum Stainless steel bars 1/8 inch by 1 inch.

2.11 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane PVC.

B. Preformed Control-Joint Gaskets: Made from PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

D. Weep/Cavity Vent Products: Use[one of] the following unless otherwise indicated:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

    a. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

        1) Advanced Building Products Inc.; Mortar Maze Cell Vent.
        2) Heckmann Building Products, Inc.; No. 85 Cell Vent.
        3) Hohmann & Barnard, Inc; QV Quadro-Vent.
        4) Wire-Bond; Cell Vent.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

    a. Advanced Building Products Inc.; Mortar BreakMortar Break II.
    b. CavClear/Archovations, Inc.; CavClear Masonry Mat.
    c. Heckmann Building Products, Inc.; Weep-Thru Mortar Deflector.
    d. Hohmann & Barnard, Inc; Mortar Trap.
    e. Mortar Net USA, Ltd; Mortar Net.
    f. Wire-Bond; Cavity NetCavity Net II.

2. Configuration: Provide one of the following:

    a. Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings.
    b. Strips, not less than 1-1/2 inches thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
    c. Sheets or strips, full depth of cavity and installed to full height of cavity.

2.12 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

    a. Diedrich Technologies, Inc.; a division of Sandell Construction Solutions.
    b. EaCo Chem, Inc.
    c. PROSOCO, Inc.

2.13 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime or masonry cement mortar unless otherwise indicated.

3. For exterior masonry, use portland cement-lime or masonry cement mortar.
4. For reinforced masonry, use portland cement-lime or masonry cement mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S.
3. For mortar parge coats, use Type S or Type N.
4. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
5. For interior nonload-bearing partitions, Type O may be used instead of Type N.

D. Colored-Aggregate Mortar: Where indicated, produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

1. Mix to match Architect's sample.
?. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
?. Clay face brick.

E. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 3000 psi.
?. Provide grout with a slump of 5 to 9 inches (200 to 280 mm) (250 to 280 mm) as measured according to ASTM C 143/C 143M.

a.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.

7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.

2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.

3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units[and hollow brick] with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Lay structural clay tile as follows:

1. Lay vertical-cell units with full head joints unless otherwise indicated. Provide bed joints with full mortar coverage on face shells and webs.
2. Lay horizontal-cell units with full bed joints unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit already in place and one side of unit to be placed.
3. Maintain joint thicknesses indicated except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch- thick joints.

D. Set trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Allow cleaned surfaces to dry before setting.
3. Wet joint surfaces thoroughly before applying mortar.
4. Rake out mortar joints for pointing with sealant.

E. Rake out mortar joints at to a uniform depth of 1/4 inch and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

F. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

1. For glazed masonry units, use a nonmetallic jointer 3/4 inch or more in width.

G. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

H. Cut joints flush where indicated to receive [waterproofing] [cavity wall insulation] [air barriers] unless otherwise indicated.

3.6 COMPOSITE MASONRY

A. Bond wythes of composite masonry together using one of the following methods:

1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. of wall area spaced not to exceed 16 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.

a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.

2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
b. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.

3. Header Bonding: Provide masonry unit headers extending not less than 3 inches into each wythe. Space headers not more than 8 inches clear horizontally and 16 inches clear vertically.

B. Bond wythes of composite masonry together using bonding system indicated on Drawings.

C. Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.

D. Collar Joints in Clay Tile Masonry: After each course is laid, fill the vertical, longitudinal joint between wythes solidly with mortar at [exterior walls, except cavity walls] [, and] [interior walls and partitions].

E. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.

1. Provide continuity with masonry-joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.

F. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:

1. Provide individual metal ties not more than 16 inches o.c.
2. Provide continuity with masonry-joint reinforcement by using prefabricated T-shaped units.
3. Provide rigid metal anchors not more than 24 inches o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.7 CAVITY WALLS

A. Bond wythes of cavity walls together [using one of the following methods] [as follows]:

1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. of wall area spaced not to exceed 16 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.

a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.

2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
b. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement[with continuous horizontal wire in facing wythe attached to ties].
c. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.

3. Header Bonding: Provide masonry unit headers extending not less than 3 inches into each wythe. Space headers not more than 8 inches clear horizontally and 16 inches clear vertically.
4. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.

B. Bond wythes of cavity walls together using bonding system indicated on Drawings.

C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

D. Parge cavity face of backup wythe in a single coat approximately 3/8 inch thick. Trowel face of parge coat smooth.

E. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.8 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers through sheathing to wall framing and to concrete and masonry backup with seismic masonry-veneer anchors to comply with the following requirements:

1. Fasten anchors through sheathing to wall framing to concrete and masonry with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed connector sections and continuous wire in masonry joints.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.

4. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
5. Space anchors as indicated, but not more than 16 inches o.c. vertically and 25 inches o.c. horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

6. Space anchors as indicated, but not more than 18 inches o.c. vertically and horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 24 inches, around perimeter.

B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.9 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

1. Space reinforcement not more than 16 inches o.c.
2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings[in addition to continuous reinforcement].

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at[corners,] returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.10 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

C. Form expansion joints in brick as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
2. Build flanges of factory-fabricated, expansion-joint units into masonry.
3. Build in compressible joint fillers where indicated.
4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch.

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.11 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.12 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape[as recommended by flashing manufacturer].

2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under water-resistive barrier, lapping at least 4 inches. Fasten upper edge of flexible flashing to sheathing through termination bar.
3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
4. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
5.
6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
7. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

E. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use specified weep/cavity vent products to form weep holes.
2. Space weep holes 24 inches o.c. unless otherwise indicated.
3. Space weep holes formed from 16 inches o.c.
4. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.
5. Trim wicking material flush with outside face of wall after mortar has set.

F. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches, to maintain drainage.

1. Fill cavities full height by placing pea gravel in cavities as masonry is laid, so that at any point, masonry does not extend more than 24 inches above top of pea gravel.

G. Place cavity drainage material in [cavities] [airspace behind veneers] to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

H. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.13 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

2. Limit height of vertical grout pours to not more than 60 inches.

3.14 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Level 1 special inspections according to the "International Building Code".

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.

F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

H. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for [mortar air content] [and] [compressive strength].

I. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.15 PARGING

A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.

C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.16 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
8. Clean stone trim to comply with stone supplier's written instructions.
9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.17 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

1. Do not dispose of masonry waste as fill within 18 inches of finished grade.

C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 05 1200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

B. Related Sections:

1. Division 01 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
2. Division 05 Section "Steel Decking" for field installation of shear connectors through deck.
3. Division 05 Section "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame miscellaneous steel fabrications and other metal items not defined as structural steel.
4. Division 05 Section "Metal Stairs."
5. Division 09 painting Sections for surface-preparation and priming requirements.

1.3 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

B. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

1.4 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated.

B. Moment Connections: Type FR, fully restrained.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
5. Identify members and connections of the seismic-load-resisting system.
6. Indicate locations and dimensions of protected zones.
7. Identify demand critical welds.
8. For structural-steel connections indicated to comply with design loads, include structural design data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

D. Qualification Data: For qualified Installer and fabricator.

E. Welding certificates.

F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

G. Mill test reports for structural steel, including chemical and physical properties.

H. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength bolt-nut-washer assemblies.
4. Shear stud connectors.
5. Shop primers.
6. Nonshrink grout.

I. Source quality-control reports.

1.6 QUALITY ASSURANCE

A. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

C. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 341 and AISC 341s1.
3. AISC 360.
4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 572/A 572M, Grade 50 (345).

B. Channels, Angles, M , S-Shapes: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M.

D. Corrosion-Resisting Structural-Steel Shapes, Plates, and Bars: ASTM A 588/A 588M, Grade 50 (345).

E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B C, structural tubing.

F. Corrosion-Resisting Cold-Formed Hollow Structural Sections: ASTM A 847/A 847M, structural tubing.

G. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.

1. Weight Class: As indicated on drawings.
2. Finish: Black except where indicated to be galvanized.

H. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.

I. Steel Forgings: ASTM A 668/A 668M.

J. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Plain.

B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

C. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
2. Washers: ASTM A 36/A 36M carbon steel.
3. Finish: Plain.

D. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

E. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.3 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanizing Repair Paint: ASTM A 780.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning."

F. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural steel. Straighten as required to provide uniform, square, and true members in completed wall framing.

G. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk machine screws, uniformly spaced not more than 10 inches (250 mm) o.c. unless otherwise indicated.

H. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.

4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.

D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION 051200

SECTION 05 2100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. K-series steel joists.
2. K-series steel joist substitutes.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of joist, accessory, and product.
B. Shop Drawings:

1. Include layout, designation, number, type, location, and spacing of joists.
2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
3. Indicate locations and details of bearing plates to be embedded in other construction.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.
B. Welding certificates.
C. Manufacturer certificates.
D. Mill Certificates: For each type of bolt.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by the Steel Joist Institute (SJI) to manufacture joists complying with SJI standard specifications and load tables.
B. SJI Specifications: Comply with SJI's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders" (hereafter, SJI's "Specifications") that are applicable to types of joists indicated.
C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
B. Do not store joists in contact with the ground.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.
B. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Plain, uncoated.

C. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: Plain.

2.2 K-SERIES STEEL JOISTS

A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.

1. Joist Type: K-series steel joists and KCS-type K-series steel joists.

B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

2.3 JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
C. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface, unless otherwise indicated.
D. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.4 CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.
B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.

C. Field weld joists to supporting steel framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts.
E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with Research Council on Structural Connections' "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

END OF SECTION 05 2100

SECTION 05 3100 - STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Roof deck

B. Related Requirements:
   1. Section 035216 "Lightweight Insulating Concrete" for lightweight insulating concrete fill over steel deck.
   2. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
   3. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

1.2 SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

C. Product certificates.

D. Welding certificates.

E. Field quality-control test and inspection reports.

1.3 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

B. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

   1. Fire-Resistance Ratings: Indicated by design designations of applicable testing and inspecting agency.
   2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

C. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ASC Profiles, Inc.
2. Canam Steel Corp.;The Canam Manac Group.
3. Consolidated Systems, Inc.
4. Cordeck Building Soluations
5. D-Mac Industries Inc.
6. Epic Metals Corporation.
7. Marlyn Steel Decks, Inc.
8. New Millennium Building Systems, LLC.
9. Nucor Corp.; Vulcraft Division.
10. Roof Deck, Inc.
11. United Steel Deck, Inc.
12. Valley Joist; Division of EBSCO Industries, Inc.
13. Verco Manufacturing Co.
14. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

2.2 ROOF DECK

A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:

1. Galvanized-Steel Sheet: ASTM A 653/A653M, Structural Steel (SS), Grade 33.

2. Deck Profile: As indicated.
3. Profile Depth: As indicated.
4. Design Uncoated-Steel Thickness: As indicated.

2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, requirements in this Section, and as indicated.

B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

G. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

H. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).

I. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.3 REPAIRS

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

END OF SECTION 053100

SECTION 05 4000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Exterior non-load-bearing wall framing.
2. Ceiling joist framing.

B. Related Sections include the following:

1. Division 05 Section "Metal Fabrications" for masonry shelf angles and connections.
2. Division 09 Section "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.
3. Division 09 Section "Gypsum Board Shaft Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding certificates.

D. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:

1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Horizontal drift deflection clips

7. Miscellaneous structural clips and accessories.

E. Research/Evaluation Reports: For cold-formed metal framing.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.

B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

D. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

E. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:

1. Allied Studco.

2. AllSteel Products, Inc.
3. California Expanded Metal Products Company.
4. Clark Steel Framing.
5. Consolidated Fabricators Corp.; Building Products Division.
6. Craco Metals Manufacturing, LLC.
7. Custom Stud, Inc.
8. Dale/Incor.
9. Design Shapes in Steel.
10. Dietrich Metal Framing; a Worthington Industries Company.
11. Formetal Co. Inc. (The).
12. Innovative Steel Systems.
13. MarinoWare; a division of Ware Industries.
14. Quail Run Building Materials, Inc.
15. SCAFCO Corporation.
16. Southeastern Stud & Components, Inc.
17. Steel Construction Systems.
18. Steeler, Inc.
19. Super Stud Building Products, Inc.
20. United Metal Products, Inc.

2.2 MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. Grade: As required by structural performance.
2. Coating: G60.

B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: As required by structural performance.
2. Coating: G90 (Z275).

2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: As indicated.
2. Flange Width: As indicated

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: As indicated
2. Flange Width: As indicated

C. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Dietrich Metal Framing; a Worthington Industries Company.
    b. MarinoWare, a division of Ware Industries.
    c. SCAFCO Corporation
    d. The Steel Network, Inc.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Minimum Base-Metal Thickness: As indicated.
3. Flange Width: 1 inch (25 mm) plus the design gap for 1-story structures and 1 inch (25 mm) plus twice the design gap for other applications.

E. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure.

2.4 CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
2. Flange Width: 1-5/8 inches (41 mm), minimum.

2.5 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers, knee braces, and girts.
9. Joist hangers and end closures.
10. Hole reinforcing plates.
11. Backer plates.

2.6 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.

D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.8 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

C. Install load bearing shims or grout between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.

D. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As indicated.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single-leg deflection tracks and anchor to building structure.
2. Install double deep-leg deflection tracks and anchor outer track to building structure.
3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
4. Connect drift clips to cold formed metal framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

a. Install solid blocking at 96-inch (2440-mm) centers.

2. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

3.5 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel framing and supports for suspended ceilings.
2. Steel framing and supports for mechanical and electrical equipment.
3. Steel and aluminum framing and supports for applications where framing and supports are not specified in other Sections.
4. Loose bearing and leveling plates for applications where they are not specified in other Sections.
5. Shelf angles.

B. Products furnished, but not installed, under this Section:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, and wedge – type inserts indicated to be cast into concrete or built into unit masonry.

C. Related Sections:

1. Division 03 Section "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Division 04 Section "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
3. Division 05 Section "Structural Steel Framing."

1.3 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.4 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.5 UALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.

D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

E. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.3 ONFERROUS METALS

A. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.

B. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

C. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

2.4 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 2.

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Eyebolts: ASTM A 489.

F. Machine Screws: ASME B18.6.3.

G. Lag Screws: ASME B18.2.1.

H. Wood Screws: Flat head, ASME B18.6.1.

I. Plain Washers: Round, ASME B18.22.1.

J. Lock Washers: Helical, spring type, ASME B18.21.1.

K. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

L. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

M. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 09 painting Sections.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

G. Concrete: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.6 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Furnish inserts for units installed after concrete is placed.

C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

D. Fabricate supports for suspended ceiling clouds from continuous beams of sizes indicated with attached bearing plates, anchors, angle brackets to provide connection to masonry or metal framed partitions.

E. Galvanize miscellaneous framing and supports where indicated.

2.8 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Galvanize exterior miscellaneous steel trim.

2.9 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

2.10 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches unless otherwise indicated.

C. Galvanize loose steel lintels located in exterior walls.

2.11 SHELF ANGLES

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.

1. Provide mitered and welded units at corners.
2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 incheslarger than expansion or control joint.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize shelf angles located in exterior walls.

D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.12 STEEL WELD PLATES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

B. Galvanize plates after fabrication.

2.13 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize exterior miscellaneous steel trim.

D. Prime interior miscellaneous steel trim, where indicated with zinc-rich primer.

2.14 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.15 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123/A 123M, for galvanizing steel and iron products.
2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

2.16 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

LANK PAGE

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel Pipe and Tube Handrails and Guardrails plus associated Brackets, Fasteners and Grout.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F,material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch, minimum, clearance from inside face of handrail to finished wall surface.

2.3 STEEL AND IRON

A. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

B. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.4 FASTENERS

A. General: Provide the following:

1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.

2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.

3. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage[, but not less than that required to support structural loads].

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with [welded] [nonwelded] [either welded or nonwelded] connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.

4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form Changes in Direction as Follows:

1. By bending or by inserting prefabricated elbow fittings.

K. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of railing members with prefabricated end fittings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

1.

2.7 STEEL AND IRON FINISHES

A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.

B. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with [universal shop primer] [primers specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting"] unless [zinc-rich primer is] [primers specified in Section 099600 "High-Performance Coatings" are] indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

D. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

3.5 ATTACHING RAILINGS

A.

B. Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.

3.

3.6 ADJUSTING AND CLEANING

A. Cleanby washing thoroughly with clean water and soap and rinsing with clean water.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099123 "Interior Painting,"

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 057500 - DECORATIVE FORMED METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

B. Section Includes:

1. Exterior Wall Mounted Aluminum Canopies

C. Related Requirements:

3. Section 076200 "Sheet Metal Flashing and Trim" for items made of formed metal for flashings and trim.

1.3 COORDINATION

A. Coordinate installation of anchorages for decorative formed metal items. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

B. Coordinate installation of decorative formed metal with adjacent construction to ensure that wall assemblies, flashings, trim, and joint sealants, are protected against damage from the effects of weather, age, corrosion, and other causes of deterioration.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product, including finishing materials.

C. Shop Drawings: Show fabrication and installation details for decorative formed metal.

1. Include plans, elevations, component details, and attachment details.
2. Indicate materials and profiles of each decorative formed metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.

D. Samples for Initial Selection: For products involving selection of color, texture, or design.

E. Samples for Verification: For each type of exposed finish required, prepared on 6-inch- square Samples of metal of same thickness and material indicated for the Work.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: For decorative formed metal elements that house items specified in other Sections. Show dimensions of housed items, including locations of housing penetrations and attachments, and necessary clearances.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For [mirrorlike stainless-steel finish] [and] [statuary conversion coating copper-alloy finish] to include in maintenance manuals.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver decorative formed metal products wrapped in protective coverings and strapped together in suitable packs or in heavy-duty cartons. Remove protective coverings before they stain or bond to finished surfaces.

B. Store products on elevated platforms in a dry location.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls, columns, beams, and other construction contiguous with decorative formed metal by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design decorative formed metal, including attachment to building construction.

B. Structural Performance: Decorative formed metal items, including anchors and connections, shall withstand the effects of gravity loads and the following loads and stresses without exceeding the allowable design working stress of materials involved and without exhibiting permanent deformation in any components:

1. Wind Loads on Exterior Items: 30 lbf/sq. ft..

C. Seismic Performance: Exterior decorative formed metal items, including anchors and connections, shall withstand the effects of earthquake motions determined according to [ASCE/SEI 7] <Insert requirement>.

1. Component Importance Factor: 1.0.

2.2 SHEET METAL

A. General: Fabricate products from sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections where exposed to view on finished units.

2.3 MISCELLANEOUS MATERIALS

A. Gaskets: As required to seal joints in decorative formed metal and remain [airtight] [weathertight]; as recommended in writing by decorative formed metal manufacturer.

1. ASTM D 1056, Type 1, Class A, grade as recommended by gasket manufacturer to obtain seal for application indicated.
2. Closed-cell polyurethane foam, adhesive on two sides, release paper protected.

B. Sealants, Exterior: ASTM C 920; elastomeric [silicone] [polyurethane] [or] [polysulfide] sealant; of type, grade, class, and use classifications required to seal joints in decorative formed metal and remain weathertight; and as recommended in writing by decorative formed metal manufacturer.

C. Sealants, Interior: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834; of type and grade required to seal joints in decorative formed metal; and as recommended in writing by decorative formed metal manufacturer.

1. Sealants shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Filler Metal and Electrodes: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded or brazed and as necessary for strength, corrosion resistance, and compatibility in fabricated items.

1. Use filler metals that will match the color of metal being joined and will not cause discoloration.

E. Fasteners: Fabricated from same basic metal and alloy as fastened metal unless otherwise indicated. Do not use metals that are incompatible with materials joined.

1. Provide concealed fasteners for interconnecting decorative formed metal items and for attaching them to other work unless [otherwise indicated] [exposed fasteners are unavoidable or are the standard fastening method].
2. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

F. Structural Anchors: For applications indicated to comply with certain design loads, provide fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193[or ICC-ES AC308].

G. Anchor Materials:

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

H. Sound-Deadening Materials:

1. Mastic: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

I. Backing Materials: Provided or recommended by decorative formed metal manufacturer.

K. Isolation Coating: Manufacturer's standard alkali-resistant coating.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble decorative formed metal items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Coordinate dimensions and attachment methods of decorative formed metal items with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.

C. Form metal to profiles indicated, in maximum lengths to minimize joints. Produce flat, flush surfaces without cracking or grain separation at bends. Fold back exposed edges of unsupported sheet metal to form a 1/2-inch- wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch and support with concealed stiffeners.

D. Increase metal thickness or reinforce with concealed stiffeners, backing materials, or both, as needed to provide surface flatness equivalent to stretcher-leveled standard of flatness and sufficient strength for indicated use.

1. Support joints with concealed stiffeners as needed to hold exposed faces of adjoining sheets in flush alignment.

E. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce decorative formed metal items as needed to attach and support other construction.

F. Provide support framing, mounting and attachment clips, splice sleeves, fasteners, and accessories needed to install decorative formed metal items.

G. Where welding or brazing is indicated, weld or braze joints and seams continuously. Grind, fill, and dress to produce smooth, flush, exposed surfaces in which joints are not visible after finishing is completed.

1. Use welding and brazing procedures that will blend with and not cause discoloration of metal being joined.

2.17 EXTERIOR CANOPIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide Mapes; Super Lumideck, or a comparable product by one of the following:

1. Americana Building Products.
2. Architectural Fabrication.
3. Dittmer Architectural Aluminum.
4. Rusco.

B. Materials:

1. Decking and fascia shall be extruded aluminum, alloy 6063-T6, in profile and thickness required by manufacturer to meet applicable loads for sizes indicated on Drawings.
2. Decking shall be 3 inches deep extruded 0.078 inch thick decking.
3. Fascia shall be standard 8-inch extruded J style (minimum 0.125 aluminum.
4. Finish: Clear Anodic Finish: Match Class 1 ANDCL1CLR, AA-M10C22A41 by Efco Corporation.

2.18 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

2.19 GENERAL FINISH REQUIREMENTS

A. Complete mechanical finishes of flat sheet metal surfaces before fabrication where possible. After fabrication, finish all joints, bends, abrasions, and other surface blemishes to match sheet finish.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of decorative formed metal.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Locate and place decorative formed metal items level and plumb and in alignment with adjacent construction. Perform cutting, drilling, and fitting required to install decorative formed metal.

1. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where needed to protect metal surfaces and to make a weathertight connection.

C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers as indicated.

D. Install concealed gaskets, joint fillers, insulation, sealants, and flashings, as the Work progresses, to make exterior decorative formed metal items weatherproof.

E. Install concealed gaskets, joint fillers, sealants, and insulation, as the Work progresses, to make interior decorative formed metal items soundproof or lightproof as applicable to type of fabrication indicated.

3.3 ADJUSTING AND CLEANING

A. Unless otherwise indicated, clean metals by washing thoroughly with water and soap, rinsing with clean water, and drying with soft cloths.

C. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

3.4 PROTECTION

A. Protect finishes of decorative formed metal items from damage during construction period. Remove temporary protective coverings at time of Substantial Completion.

END OF SECTION 057500

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.
2. Plywood backing panels.

B. Related Requirements:

1. Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

E. Timber: Lumber of 5 inches nominal size or greater in least dimension.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterbourne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.[Do not use inorganic boron (SBX) for sill plates.]

2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

E. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.
2. Framing for non-load-bearing partitions.
3. Roof construction.
4. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

1. Hem-fir (north); NLGA
2. Hem-fir; WCLIB or WWPA

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 and ICC-ES AC193 as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Gluing to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate [furring,]nailers, blocking, [grounds,]and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

D. Do not splice structural members between supports unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

F. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

J. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

K. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for[screeding or] attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Sheathing joint and penetration treatment.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for plywood backing panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5516.
4. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WOOD PANEL PRODUCTS

A. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

B. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items as indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

?. Application: Treat all plywood unless otherwise indicated.

1. Roof and wall sheathing within 48 inches of fire walls.

2.5 WALL SHEATHING

A. Plywood Sheathing: , sheathing.

1. Span Rating: Not less than 24/0.
2. Nominal Thickness: Not less than 1/2 inch.

B. Oriented-Strand-Board Sheathing: DOC PS 2, sheathing.

1. Span Rating: Not less than 24/0.
2. Nominal Thickness: Not less than 1/2 inch.

C. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

    a. CertainTeed Corporation.
    b. Georgia-Pacific Gypsum LLC.
    c. National Gypsum Company.
    d. USG Corporation.

2. Type and Thickness: Regular, 1/2 inch thick.
3. Size: 48 by 96 inches for vertical installation.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.

1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C1002.
2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C954.

2.7 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

2.8 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with ASTM D3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

   a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
   b. Screw to cold-formed metal framing.
   c. Space panels 1/8 inch apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

E. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 061600

SECTION 062023 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior trim.

a. Houses at Media Center
b. Trees at Media Center
c. Trim at wall opening in office renovation (by alternate)

1.3 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. MDO: Plywood with a medium-density overlay on the face.

C. PVC: Polyvinyl chloride.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation.

1. Protect materials from weather by covering with waterproof sheeting, securely anchored.
2. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber, mark grade stamp on end or back of each piece[, or omit grade stamp and provide certificates of grade compliance issued by grading agency].

B. Hardboard: ANSI A135.4.

C. MDF: ANSI A208.2, Grade 130.

D. Particleboard: ANSI A208.1, Grade M-2.

2.2 INTERIOR TRIM

A. Hardwood Lumber Trim for Transparent Finish (Stain or Clear Finish): Trees at Media Center

1. Species and Grade: Red oak; NHLA Clear A Finish.
2. Maximum Moisture Content: percent.
3. Finger Jointing: Not allowed.
4. Gluing for Width: Allowed.
5. Veneered Material: Not allowed.
6. Face Surface: Surfaced (smooth).
7. Matching: Selected for compatible grain and color.

B. Lumber Trim for Opaque Finish (Painted Finish): Houses at Media Center & Wood Trim at Opening in office renovation.

1. Species and Grade: Alder, aspen, basswood, cottonwood, gum, magnolia, soft maple, sycamore, tupelo, or yellow poplar; NHLA A Finish.
2. Maximum Moisture Content: percent.
3. Finger Jointing: Not allowed.
4. Face Surface: Surfaced (smooth).

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

C. Multipurpose Construction Adhesive: Formulation, complying with ASTM D 3498, that is recommended for indicated use by adhesive manufacturer.

2.4 FABRICATION

A. Back out or kerf backs of the following members, except those with ends exposed in finished work:

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours[unless longer conditioning is recommended by manufacturer].

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
3. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available.

1. Do not use pieces less than 24 inches long, except where necessary.
2. Stagger joints in adjacent and related standing and running trim.
3. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.
4. Use scarf joints for end-to-end joints.
5. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
6. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
7. Install trim after gypsum-board joint finishing operations are completed.
8. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.
9. Fasten to prevent movement or warping.
10. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements.

1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

B. Adjust joinery for uniform appearance.

3.6 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces.

B. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.7 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062023

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Foam-plastic board insulation.
2. Glass-fiber blanket insulation.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for insulation installed in cavity walls and masonry cells.
2. Division 07 Section "Fire-Resistive Joint Systems" and “Penetration Firestopping” for insulation installed as part of a perimeter fire-resistive joint system.
3. Division 09 Section(s) "Gypsum Board" for installation in metal-framed assemblies of insulation specified by referencing this Section.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.

3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation for foundation walls and footings: ASTM C 578, of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements,:

a. DiversiFoam Products.
b. Dow Chemical Company (The).
c. Owens Corning.
d. ACH Foam Technologies

2. Type IV, 25 psi.
3. 2” Thick

B. Foil-Faced, Polyisocyanurate Board Insulation for cavity walls: ASTM C 1289, Type I, Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Atlas Roofing Corporation.
b. Dow Chemical Company (The).
c. Rmax, Inc.
d. Hunter Panels

2. 2 1/2” Thick

C. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

2.2 GLASS-FIBER BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

1. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Knauf Insulation.
5. Owens Corning.

B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

C. Foil-Faced, Glass-Fiber Blanket, Unfaced: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm.); Category 1 (membrane is a vapor barrier, faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

D. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:

1. 3-5/8 inches thick with a thermal resistance of 13 deg F x h x sq. ft./Btu at 75 deg F.
2. 5-1/2 inches thick with a thermal resistance of 19 deg F x h x sq. ft./Btu at 75 deg F.
3. 6-1/2 inches thick with a thermal resistance of 21 deg F x h x sq. ft./Btu at 75 deg F.
4. 10 inches thick with a thermal resistance of 30 deg F x h x sq. ft./Btu at 75 deg F.

E. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:

1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

2.3 SAFING INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Fibrex Insulations Inc.
2. Owens Corning.
3. Roxul Inc.

B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoked-developed indexes of 5, per ASTM E 8.
2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 45, respectively, per ASTM E 84.

2.5 INSULATION FASTENERS

A. Adhesively Attached: Secure rigid insulation in place with adhesives recommended by manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF BELOW-GRADE INSULATION

A. On vertical footing and foundation wall surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.

1. If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.
2. At full walls below grade, insulation shall extend to footing.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. Foil-Faced, Polyisocyanurate Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Division 04 Section "Unit Masonry."

3.4 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Foam-Plastic Board Insulation: Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

C. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.

5. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

3.5 INSTALLATION OF INSULATION FOR CONCRETE AND MASONRY SUBSTRATES

A. Install board insulation on concrete and masonry substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete and masonry substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.

2. Apply insulation standoffs to each spindle to create cavity width indicated between concrete and masonry substrates and insulation.
3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

END OF SECTION 072100

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes fluid-applied, vapor-permeable membrane air barriers.

B. Related Requirements:

1. Section 061600 "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments.

1.3 DEFINITIONS

A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

B. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.

B. Shop Drawings: For air-barrier assemblies.

1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
2. Include details of interfaces with other materials that form part of air barrier.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by the Installer, who work on Project.

B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.

B. Mockups: Build mockups to set quality standards for materials and execution and for preconstruction testing.

1. Build integrated mockups of exterior wall assembly , incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.

a. Coordinate construction of mockups to permit inspection by Owner's testing agency of air barrier before external insulation and cladding are installed.
b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Remove and replace liquid materials that cannot be applied within their stated shelf life.

B. Protect stored materials from direct sunlight.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 283 ASTM E 783 or ASTM E 2357.

2.3 VAPOR-PERMEABLE MEMBRANE AIR-BARRIER

A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: synthetic polymer membrane.

1. Synthetic Polymer Membrane:
2. Products: Subject to compliance with requirements, provide Carlisle Coatings & Waterproofing Inc.; Barritech VP. (Basis of design):

    a. Carlisle Coatings & Waterproofing Inc.; Barritech VP.
    b. Grace, W. R., & Co. - Conn.; Perm-A-Barrier VP.
    c. Henry Company; .
    d. Rubber Polymer Corporation, Inc.; Rub-R-Wall Airtight VP.
    e. Tremco Incorporated, an RPM company; ExoAir 230.
    f. TK Products; AirMax 2104 VP
    g. WR Meadows Sealtight: Air-Shield LMP

2.4 ACCESSORY MATERIALS

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.

B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.

C. Counterflashing Strip: Modified bituminous, 40-mil- thick, self-adhering sheet consisting of 32 mils of rubberized asphalt laminated to an 8-mil- thick, cross-laminated polyethylene film with release liner backing.

D. Butyl Strip: Vapor retarding, 30 to 40 mils thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing.

E. Joint Reinforcing Strip: Air-barrier manufacturer's glass-fiber-mesh tape.

F. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.

H. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0250 inch thick, and Series 300 stainless-steel fasteners.

I. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

J. Adhesive-Coated Transition Strip: Vapor-permeable, 17-mil- thick, self-adhering strip consisting of an adhesive coating over a permeable laminate with a permeance value of 37 perms.

K. Elastomeric Flashing Sheet: ASTM D 2000, minimum 50- to 65-mil- thick, cured sheet neoprene with manufacturer-recommended contact adhesives and lap sealant with [stainless-steel termination bars and fasteners] [aluminum termination bars and stainless-steel fasteners] [galvanized-steel termination bars and fasteners].

L. Preformed Silicone-Sealant Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; 123 Silicone Seal.
b. Pecora Corporation; Sil-Span.
c. Tremco Incorporated, an RPM company; Spectrem Simple Seal.

M. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."

N. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.

1. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
2. Verify that masonry joints are flush and completely filled with mortar.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 JOINT TREATMENT

A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air-barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.

B. Prime substrate and apply a single thickness of air-barrier manufacturer's recommended preparation coat extending a minimum of 3 inches along each side of joints and cracks. Apply a double thickness of fluid air-barrier material and embed a joint reinforcing strip in preparation coat.

C. Gypsum Sheathing: Fill joints greater than 1/4 inch with sealant according to ASTM C 1193 and air-barrier manufacturer's written instructions. Apply first layer of fluid air-barrier material at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air-barrier material over joint reinforcing strip.

3.4 TRANSITION STRIP INSTALLATION

A. General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.

1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by fluid air-barrier material on same day. Re-prime areas exposed for more than 24 hours.

1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

C. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

E. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

F. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.

1. Adhesive-Coated Transition Strip: Roll firmly to enhance adhesion.
2. Elastomeric Flashing Sheet: Apply adhesive to wall, frame, and flashing sheet. Install flashing sheet and termination bars, fastened at 6 inches o.c. Apply lap sealant over exposed edges and on cavity side of flashing sheet.
3. Preformed Silicone-Sealant Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.

G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.

I. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, [modified bituminous] [counterflashing] strip.

J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counter flashings or ending in reglets with termination mastic.

K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fish-mouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.5 FLUID AIR-BARRIER MEMBRANE INSTALLATION

A. General: Apply fluid air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges.

1. Apply primer to substrates at required rate and allow it to dry.
2. Limit priming to areas that will be covered by fluid air-barrier material on same day. Re-prime areas exposed for more than 24 hours.
3. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

B. Membrane Air Barriers: Apply a continuous unbroken air-barrier membrane to substrates according to the following thickness. Apply air-barrier membrane in full contact around protrusions such as masonry ties.

1. Vapor-Permeable Membrane Air Barrier: Total dry film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 40-mil dry film thickness 40-mil dry film thickness, applied in one or more equal coats.

C. Apply strip and transition strip a minimum of 1 inch onto cured air-barrier material according to air-barrier manufacturer's written instructions.

D. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.

E. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:

1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
2. Continuous structural support of air-barrier system has been provided.
3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
4. Site conditions for application temperature and dryness of substrates have been maintained.
5. Maximum exposure time of materials to UV deterioration has not been exceeded.
6. Surfaces have been primed, if applicable.
7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fish-mouths.
8. Termination mastic has been applied on cut edges.
9. Strips and transition strips have been firmly adhered to substrate.
10. Compatible materials have been used.
11. Transitions at changes in direction and structural support at gaps have been provided.
12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
13. All penetrations have been sealed.

C. Tests: As determined by Owner's testing agency from among the following tests:

1. Adhesion Testing: Air-barrier assemblies will be tested for minimum air-barrier adhesion of 30 lbf/sq. in. according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.

D. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

3.7 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION 072726

SECTION 074213.13 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

Concealed-fastener, lap-seam metal wall panels.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

Field quality-control reports.

Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 |CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

A. General: Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.

B. Flush-Profile, Concealed-Fastener Metal Wall Panels : Formed with vertical panel edges and a flat pan between panel edges; with a reveal joint between panels.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Berridge, HS-12 or comparable product by one of the following:

AEP Span; A BlueScope Steel Company.
Alcoa Architectural Products (USA).
Architectural Metal Systems.
CENTRIA Architectural Systems.
Fabral.
Flexospan Steel Buildings, Inc.

Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 0.034 inch.
b. Exterior Finish: Two-coat fluoropolymer, over standard Stucco Finish..
c. Color: As selected by Architect from manufacturer's full range.

2. Panel Coverage: 12 inches.
Metal Sales Manufacturing CorporationVICWESTMISCELLANEOUS MATERIALS

Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

3. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
4. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

2.2 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.3 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13

SECTION 075113.11 - BUILT-UP ASPHALT ROOFING, HOT-APPLIED PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Hot-applied built-up asphalt roofing system on metal deck, including but not limited to:

a. Roof insulation.
b. Roof membrane and membrane base flashings.
c. Roof surfacing consisting of adhesive surfacer with aggregate surfacing.

B. Related Sections:

1. Division 06 Section " Miscellaneous Rough Carpentry " for wood nailers, wood cants, curbs, and blocking.

C. Allowances: Refer to Division 01 Section "Allowances" for description of Work in this Section affected by allowances.

D. Unit Prices: Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to built-up roofing.

B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 deg F, measured at the mop cart or mechanical spreader immediately before application.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacings and patterns for mechanically fastenedcomponents.

1. Base flashings and built-up terminations.

a. Indicate details meet requirements of NRCA and FMG required by this Section.

2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:

1. Sheet roofing materials, of color specified for exposed material.
2. Roof insulation.
3. 1 lb. of aggregate surfacing material in gradation and color indicated.
4. Walkway material.
5. Six insulation fasteners of each type, length, and finish.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, Manufacturer, and Roofing Inspector. Include letter from Manufacturer written for this Project indicating approval.

1. Include letter from Manufacturer written for this Project indicating approval of Installer.

B. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that built-up roofing complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of compliance with performance requirements, including roofing membrane system load/strain properties certification for roofing systems identical to those proposed for this Project.
2. Indicate that proposed system components are compatible.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.

E. Warranties: Unexecuted sample copies of special warranties.

F. Field Quality Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing similar work, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to furnish warranty of type specified.

B. Manufacturer Qualifications: Approved manufacturer with UL listed roofing systems comparable to those specified for this Project, with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

    a. Product data, including certified independent test data indicating compliance with requirements.
    b. Samples of each component.
    c. Sample submittal from similar project.
    d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
    e. Sample warranty.

2. Approved manufacturers must meet separate requirements of Submittals Article.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

D. Source Limitations: Obtain roofing system components from or approved in writing by roofing system manufacturer.

E. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written

recommendations and instructions for installation of products.

F. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review drawings and specifications.
3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and afterroofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting duringinstallation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent
deflection of deck.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove temporary plugs from roof drains at end of each day.
4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Manufacturer's Warranty: Manufacturer's standard or customized form in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Manufacturer's warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section.
2. Warranty Period: 20 years from date of Substantial Completion.

C. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

D. Extended Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:

1. Sheet metal flashing and trim, including roof penetration flashings.
2. Manufactured copings, roof edge, counterflashings, and reglets.
3. Roof curbs, hatches, and penetration flashings.
4. Roof and parapet expansion joint assemblies.
5. Metal roof, wall, and soffit panels and trim.
6. Walk Pads

E. Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections and preventive maintenance, (to include general housekeeping and minor repairs,) is included in the Contract Sum. Inspections to occur in Years 2 and 5 10, 15, of following completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by a manufacturer meeting qualification requirement in Quality Assurance Article.

B. Basis-of-Design Manufacturer/Product: The roof system specified in this Section is based upon Tremco, Inc. products named in other Part 2 articles. Provide specified products.

1. Alternate materials must be approved by specifier 10 days before bids due date.
2. Any substitute MUST hit all specified warranty requirements and quality assurance requirements along with PERFORMANCE requirements and MUST be approved by the school district.

C. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by built-up roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide roofing system that is identical to systems that have been
successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures.

D. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:

E. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail
flashings and component materials and installation techniques that comply with requirements and recommendations of the following:

1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.

F. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

G. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.3 ROOFING MEMBRANE BASE SHEET

A ASTM D 4601 Type II non-perforated SBS-modified asphalt coated fiberglass/fiberglass/ polyester reinforced high tensile strength sheet dusted with fine mineral surfacing on both sides.
Tensile Strength, minimum, ASTM D 5147: Machine direction, 165 lbf/in (28.9 kN/m); Cross machine direction, 150 lbf/in (26.3 kN/m).
Tear Strength, minimum, ASTM D 5147: Machine direction, 210 lbf (0.9 kN); Cross machine direction, 185 lbf (0.8 kN).
Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 5147: 6 percent.
Thickness, minimum, ASTM D 146: 0.055 inch (1.4 mm).

2.4 ROOFING MEMBRANE PLY SHEETS

A. ASTM D 2178 Type VI premium asphalt-impregnated glass-fiber ply sheet.

1. Net Dry Mass, ASTM D 146: 8 lb/100 sq. ft..
2. Breaking Strength, minimum, ASTM D 146: Machine direction, 70 lbf/in (12 kN/m); cross machine direction, 60 lbf/in (10 kN/m).

2.5 BASE FLASHING SHEETS

A. Base Flashing Sheet:

1. Thermoset elastomeric flashing sheet, polyester-reinforced with EPDM and SBR elastomers.

    a. Breaking Strength, minimum, ASTM D 751: Machine direction 350 lbf; Cross machine direction 300 lbf.
    b. Tear Strength, minimum, ASTM D 751: Machine direction 77 lbf; Cross machine direction 77 lbf.
    c. Elongation at Failure, minimum, ASTM D 751: 30 percent.
    d. Low Temperature Flexibility, minimum, ASTM D 2136: -40 deg. F (-40 deg. C).
    e. Thickness, minimum, ASTM D 751: 0.045 inch.
    f. Color: Black.

2.6 ASPHALT MATERIALS

A. ASTM D 312 Type IV hot-melt asphalt.

1. Softening Point, min/max, ASTM D 36: 215225 deg. F (102107 deg. C).
2. Ductility at 77 deg. F, minimum, ASTM D 113: 2.5 cm.
3. Penetration at 77 deg. F (25 deg. C), min/max, ASTM D 5: 1530 dmm.

2.7 AUXILIARY BUILT-UP ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Cold Applied Adhesive:

1. Cold-applied one-part butyl-based elastomer adhesive for flashing membranes.

    a. VOC, maximum, ASTM D 3960: <250 g/L.
    b. Adhesion in peel, ASTM D 1876: 3 lbf/in (0.5 N/mm).
    c. Lap shear adhesion, ASTM D 3960: 18 psi.

2. Cold-applied roofing adhesive and surfacer, one-part, formulated for compatibility and use with specified roofing membranes and flashings.

   a. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.
   b. Nonvolatile Content, minimum, ASTM D 6511: 72 percent.
   c. Flash Point, minimum, ASTM D 93: 100 deg F.

3. Roof Cement, Asphalt-Based: ASTM D 4586, Type II, Class I, fibrated roof cement formulated for use in installation and repair of asphalt ply and modified bitumen roofing plies and flashings; UL-classified for fire resistance.

   a. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 190 g/L.
   b. Non-Volatile Matter, ASTM D 4586: 85 percent.

C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing manufacturer for application.

D. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion- resistance provisions in FM Approvals 4470, designed for fastening built-up roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing manufacturer.

F. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

G. Miscellaneous Accessories: Provide miscellaneous accessories recommended by built-up roofing manufacturer.

2.8 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.

B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.

1. Minimum. Thickness to achieve R-30.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.9 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with built-up roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate and acceptable to roofing manufacturer.

C. Insulation Adhesive:

1. Low rise Foam Adhesive-Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.

a. Flame Spread Index, ASTM E 84: 10.
b. Smoke Developed Index, ASTM E 84: 30.
c. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 0 g/L.
d. Tensile Strength, minimum, ASTM D 412: 250 psi.
e. Peel Adhesion, minimum, ASTM D 903: 17 lbf/in (2.98 kN/m).
f. Flexibility, 70 deg. F (39 deg. C), ASTM D 816: Pass.

D. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

E. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

F. Cover Boards: Cellulosic fiber reinforced water-resistant gypsum panel, ASTM C 1278/C 1278M.
Tremco, USG Securerock,
Size: ½•

G. Substrate Joint Tape: 6- or 8-inch- wide, coated, glass fiber.

2.10 SURFACING

A. Aggregate Stone Surfacing: Clean, dry, opaque, water-worn or crushed stone, free of sharp edges.

B. Basis of design product: Aggregate Stone Surfacing.

C. Size, ASTM D 1863: No. 6 or 67.

2.11 WALKWAYS

A. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition or polymer-modified, reconstituted solid-rubber, surface-textured, slip-resisting pads,

manufactured as a traffic pad for foot traffic and acceptable to roofing manufacturer, ½ inch thick minimum.

1. Pad Size: Manufacturer™s standard PART 3 - EXECUTION

2.12 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation. wood cants
3. Steel Roof Deck:

    a. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."
    b. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.13 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

2.14 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer's recommendations.

B. Install roofing system in accordance with the following NRCA Manual Plates and NRCA recommendations; modify as required to comply with requirements of FMG references above:

1. Metal Parapet Cap (Coping) and Base Flashing: Plates BUR-1 and BUR-1S.
2. Surface-Mounted Counterflashing for Concrete Walls (at Parapet Wall): Plates BUR-4 and BUR-4S.

3. Base Flashing for Wall-supported Deck: Plates BUR-5 and BUR-5S.
4. Base Flashing for Non-wall-supported deck (Movement Joint): Plates BUR-6 and BUR- 6S.
5. Base and Surface-mounted Counterflashing: Plates BUR-4 and BUR-4S.
6. Base Flashing for Vented Base Sheet: Plates BUR-5A and BUR-5AS.
7. Raised Perimeter Edge with Metal Flashing (Fascia Cap): Plates BUR-2 and BUR-2S.
8. Embedded Edge Metal Flashing Edge (Gravel-stop): Plates BUR-3 and BUR-3S.
9. Scupper Through Raised Perimeter Edge: Plates BUR-21 and BUR-21S.
10. Gutter at Draining Edge: Plates BUR-22 and BUR-22S.
11. Expansion Joint with Metal Cover: Plates BUR-7 and BUR-7S and Division 07 Section "Sheet Metal Flashing and Trim."
12. Expansion Joint with Premanufactured Cover: Plates BUR-7A and BUR-7AS and Division 07 Section "Roof Expansion Assemblies."
13. Area Divider in Roof System: Plates BUR-8 and BUR-8S.
14. Equipment Support Curb: Plates BUR-9 and BUR-9S.
15. Equipment Support Stand: Plates BUR-10.
16. Equipment Support Stand and Typical Rain Collar Penetration Detail: Plates BUR-11 and BUR-11S.
17. Raised Curb Detail at Rooftop HVAC Units, Premanufactured: Plates BUR-12 and BUR- 12S and Division 7 Section "Roof Accessories."
18. Raised Curb Detail at Rooftop HVAC Units (Job site constructed wood curb): Plates BUR-13 and BUR-13S and Division 06 Section "Miscellaneous Rough Carpentry."
19. Skylight, Scuttle (Roof Hatch), and Smoke Vents: Plates BUR-14 and BUR-14S and Division 07 Section "Roof Accessories."
20. Penetration, Structural Member through Roof Deck: Plates BUR-15 and BUR-15S.
21. Penetration, Sheet Metal Enclosure for Piping Through Roof Deck: Plates BUR-16 and BUR-16S
22. Penetration, Isolated Stack Flashing: Plates BUR-17 and BUR-17S.
23. Penetration, Isolated Stack Flashing: Plates BUR-17A and BUR-17AS.
24. Penetration, Plumbing Vent: Plates BUR-18 and BUR-18S.
25. Penetration, Pocket: Plates BUR-19 and BUR-19S.
26. Roof Drain: Plates BUR-20 and BUR-20S.
27. Roof Drain: Plates BUR-20A and BUR-20AS.
28. Guide for Clearances between Pipes / Walls / Curbs - Table 4
29. Guide for Crickets and Saddles - Table 5
30. Guide for Edge Scuppers with Tapered Saddles - Table 6

2.15 INSULATION INSTALLATION AT METAL DECK

A. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Install one lapped base sheet course and mechanically fasten to substrate according to built-up roofing manufacturer's written instructions.

D. Cant Strips: Install and secure preformed 45-degree cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

E. Install tapered insulation under area of roofing to conform to slopes indicated.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

G. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

1. Install insulation at average overall thickness of minimum 4-1/2 inches.

H. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type per manufacturer.

I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together. Tape joints if required by roofing manufacturer.

1. In Low rise foam adhesive at application rate per manufacturer.

2.16 HOT-APPLIED BUILT-UP ROOFING INSTALLATION, GENERAL

A. Install roofing membrane according to roofing manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing" and as follows:

1. Deck Type: Metal deck.
2. Base Sheet: One.

a. Adhering Method: Mopped.

3. Number of Asphalt Ply Sheets: Three.

a. Adhering Method: Mopped.

4. Surfacing Type: A (aggregate).

B. Start installation of built-up roofing in presence of manufacturer's technical personnel.

C. Cooperate with testing agencies and personnel engaged or required to perform services for installing roofing.

D. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new and existing roofing.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove temporary plugs from roof drains at end of each day.
4. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Hot Roofing Asphalt Heating: Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application. Circulate asphalt during heating. Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating. Do not heat asphalt within 25 deg F of flash point. Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than fourhours.

1. Apply hot roofing asphalt within plus or minus 25 deg F of equiviscous temperature and adhere components to asphalt heated to not less than 425 deg F.

F. Hot Roofing Asphalt Heating, SEBS-Modified Asphalt: Heat and apply SEBS-modified elastomeric roofing asphalt according to roofing system manufacturer's writteninstructions.

G. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent
building construction.

2.17 ROOFING MEMBRANE INSTALLATION

A. Install lapped base sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Adhere to substrate in a solid mopping of hot roofing asphalt.

B. Install ply sheets starting at low point of roofing. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.

1. Embed each ply sheet in a solid mopping of hot roofing asphalt applied at rate required by roofing manufacturer, to form a uniform membrane without ply sheets touching.

2.18 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to built-up roofing manufacturer's written instructions and as follows:

1. Prime substrates with asphalt primer if required by built-up roofing manufacturer.
2. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive at rate required by roofing manufacturer. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

B. Seal top termination of base flashing with a metal termination bar.

C. Install stripping, according to roofing manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing.

1. Flashing-Sheet Stripping: Install flashing-sheet stripping in a continuous coating of cold- applied adhesive and extend onto roofing membrane.

D. Roof Drains: Set 30-by-30-inch metal flashing in bed of asphalt roofing cement on completed built-up roofing. Cover metal flashing with built-up roofing cap-sheet stripping and extend a minimum of 6 inches beyond edge of metal flashing onto field of built-up roofing. Clamp built-up roofing, metal flashing, and stripping into roof-drain clamping ring.

1. Install flashing sheet stripping according to roofing manufacturer's written instructions.

2.19 SURFACING AND COATING INSTALLATION

A. Aggregate Surfacing: Promptly after installing and testing roofing membrane, base flashing, and stripping, flood-coat roof surface with 60 lb./100 sq. ft. of hot roofing asphalt. While flood coat is hot and fluid, cast the following average weight of aggregate in a uniform course:

1. 1. Coverage rate: 4 gallons per 100 sq. ft. Of Burmastic Emulsion. Broadcast Meramac gravel at 450-500 lbs per sq.

B. Apply coating to base flashings. according to manufacturer's written instructions, by spray, roller, or other suitable application method to provide a dry film thickness of not less than 20 mils.

2.20 FIELD QUALITY CONTROL

A. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 10 full-time days on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

B. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

2.21 PROTECTING AND CLEANING

A. Protect built-up roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, and repair or reinstall roofing to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075113.11

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.
4. Formed equipment support flashing.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each of the following

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.

6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.9 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide ; prepainted by coil-coating process to comply with ASTM A755/A755M.

1. Surface: Smooth, flat.
2. Exposed Coil-Coated Finish:

    a. Mica Flouroplymer: AAMA 621. Two-coat fluouropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

3. Color: As selected by Architect from manufacturer's full range.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective caotings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory applied coating. Provide metal backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.

C. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

D. Butyl Sealant: ASTM C 1311, single component solvent release butyl rubber sealant; polyisobutylene plasticized; heavy bodies for hooked type expansion joints with limited movement.

E. Bitiminous Coating: Cold applied asphalt emulsion according to ASTM D 1187.

2.4 FABRICATION, GENERAL

A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.

1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

3. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard[and by FM Global Property Loss Prevention Data Sheet 1-49] for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

H. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.

1. Fabricated Hanger Style: Fig. 1-35B in accordance with SMACNA's "Architectural Sheet Metal Manual."
2. Fabricate from the following materials:

a. Galvanized Steel: 0.022 inch thick.

B. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

D. Splash Pans: Fabricate to dimensions and shape required and from the following materials:

1. Stainless Steel: 0.019 inch thick.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and[drill elongated holes for fasteners on] interior leg. Miter corners, [fasten and seal] [solder or weld] watertight.[Shop fabricate interior and exterior corners.]

1. Coping Profile: [Fig. 3-4A] [Fig. 3-4B] [Fig. 3-4C] [Fig. 3-4D] [Fig. 3-4E] [Fig. 3-4F] [Fig. 3-4G] in accordance with SMACNA's "Architectural Sheet Metal Manual."

2. Joint Style: [Butted with expansion space and 6-inch- wide, concealed backup plate] [Butted with expansion space and 6-inch- wide, exposed cover plate] <Insert description>.
3. Fabricate from the following materials:

a. Copper: [24 oz./sq. ft.] <Insert value>.
b. Aluminum: [0.050 inch] <Insert dimension> thick.
c. Stainless Steel: [0.025 inch] <Insert dimension> thick.
d. Zinc-Tin Alloy-Coated Copper: [24 oz./sq. ft.] <Insert value>.
e. Galvanized Steel: [0.040 inch] <Insert dimension> thick.
f. Aluminum-Zinc Alloy-Coated Steel: [0.040 inch] <Insert dimension> thick.
g. Zinc: [0.048 inch] [0.059 inch] <Insert dimension> thick.
h. Copper-Clad Stainless Steel: [0.027 inch] <Insert dimension> thick.

B. Roof-to-Wall Transition: Fabricate from the following materials:

1. Galvanized Steel: 0.034 inch thick.

C. Counterflashing: [Shop fabricate interior and exterior corners.]Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

A. Install slip sheet, wrinkle free, before installing sheet metal flashing and trim.

1. Install in shingle fashion to shed water.
2. Lapp joints not less than 4 inches.

3.3 INSTALLATION, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.

1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder welds sealant.
3. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated.

a. Embed hooked flanges of joint members not less than 1 inch into sealant.
b. Form joints to completely conceal sealant.
c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
d. Adjust setting proportionately for installation at higher ambient temperatures.

1) Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.4 INSTALLATION OF ROOF-DRAINAGE SYSTEM

A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches o.c.
4. Provide elbows at base of downspout to direct water away from building.
5. Connect downspouts to underground drainage system.

C. Splash Pans:

1. Install where downspouts discharge on low-slope roofs.
2. Set in compatible with the substrate.

D. Parapet Scuppers:

1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

2. Anchor scupper closure trim flange to exterior wall and to scupper.
3. Loosely lock front edge of scupper with conductor head.
4. exterior wall scupper flanges into back of conductor head.

E. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below scupper discharge.

F. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated on Drawings. Lap joints minimum of 4 inches in direction of water flow.

3.5 INSTALLATION OF ROOF FLASHINGS

A. Install sheet metal flashing and trim to comply with performance requirements[, sheet metal manufacturer's written installation instructions,] and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless steel draw band and tighten.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
2. Extend counterflashing 4 inches over base flashing.
3. Lap counterflashing joints minimum of 4 inches.
4. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with sealant and clamp flashing to pipes that penetrate roof.

3.6 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interefere with uninform oxidation and weathering.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completions of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Copings and Expansion Joint Copings.

B. Related Requirements:

1. Section 076200 "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.

C. Preinstallation Conference

1. Meet with Owner, Architect, Owner's insurer if applicable, roofing-system tersting and inspecting agency representative, roofing installer, roofing-system manufacturer's representative. Installer structural-support installer, and installers whose work interfaces with or affects roof specialties, insluding installers of roofing materials and accessories.
2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Detail termination points and assemblies, including fixed points.
5. Include details of special conditions.

C. Samples for initial selection: For each type of roof specialty indicated with factory-applied color finishes.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class and SPRI ES-1 tested to specified design pressure.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested accoding to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. FM Approvals' Listing: Manufacture and install copings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with FM Approvals' markings.

C. SPRI Wind Design Standard: Manufacture and install copings tested according to SPRI ES-1 and capable of resisting the following design pressures:

1. Design Pressure: As indicated on Drawings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COPINGS

1. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.Basis-of-Design Product: Subject to compliance with requirements, provide Metal Era Perma-Tite Coping (6" fascia) or comparable product by one of the following:

    a. Hickman Company, W. P.
    b. Metal-Era, Inc.
    c. Metal-Fab Manufacturing, LLC.
    d. Perimeter Systems; a division of SAF.

2. Metallic-Coated Steel Sheet Coping Caps: Zinc-coated (galvanized) steel, nominal 0.028-inch thickness.

    a. Surface: Smooth, flat finish.
    b. Finish: Two-coat fluoropolymer.
    c. Color: As selected by Architect from manufacturer's full range.

3. Corner: Factory mitered and continuously welded.
4. Coping-Cap Attachment Method: Snap-on or face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.

    a. Snap-on Coping Anchor Plates: Concealed, galvinized-steel sheet, 16 inches wide, with integral cleats.

    b. Face-Leg Cleats: Concealed, continuous galvinized-steel sheet.

2.3 MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.

2.4 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, unperforated.

B. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. minimum.

2.5 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

B. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Coil-Coated Galvanized-Steel Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A 755/A 755M and coating and resin manufacturers' written instructions.

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

B. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet with no joints within 1 8 inches of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.4 COPING INSTALLATION

A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.

3.5 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Roof hatches.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
2. Section 055213 "Pipe and Tube Railings" for safety railing systems not attached to roof-hatch curbs.
3. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.

1.3 COORDINATION

A. Coordinate layout and installation of roof accessories with [roofing membrane and base flashing and]interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof accessories.

1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:

1. Size and location of roof accessories specified in this Section.
2. Method of attaching roof accessories to roof or building structure.
3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
4. Required clearances.

1.6 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design [roof curbs] [and] [equipment supports] to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Wind-Restraint Performance: [As indicated on Drawings] <Insert requirements>.

2.2 ROOF HATCHES

A. Roof Hatches: Metal roof-hatch units with lids and insulated single-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

a. Babcock-Davis.
b. Bilco Company (The).
c. JL Industries, Inc.; a division of the Activar Construction Products Group.
d. Kingspan Light + Air, North America.
e. Milcor; Commercial Products Group of Hart & Cooley, Inc.
f. O'Keeffe's Inc.
g. Precision Ladders, LLC.

B. Type and Size: Single-leaf lid, 36 by 36 inches.

C. Loads: Minimum 40-lbf/sq. ft. external live load and internal uplift load.

D. Hatch Material: Zinc-coated (galvanized) steel sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated.

2. Finish: Factory prime coating.

3. Color: Match Architect's sample.

E. Construction:

1. Insulation: 2-inch- thick, polyisocyanurate board.

2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
3. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.

4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
6. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
7. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.

F. Hardware: Spring operators, hold-open arm, galvanized -steel spring latch with turn handles, galvanized -steel butt- or pintle-type hinge system, and padlock hasps inside and outside.

1. Provide two-point latch on lids larger than 84 inches.

G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.

1. Height: 42 inches above finished roof deck.
2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches in diameter or galvanized-steel tube, 1-5/8 inches in diameter.
3. Flat Bar: Galvanized steel, 2 inches high by 3/8 inch thick.
4. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches in diameter.

5. Chain Passway Barrier: Galvanized proof coil chain with quick link on fixed end.
6. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
7. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
8. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
9. Fabricate joints exposed to weather to be watertight.
10. Fasteners: Manufacturer's standard, finished to match railing system.
11. Finish: Manufacturer's standard.

    a. Color: As selected by Architect from manufacturer's full range.

2.3 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Verify dimensions of roof openings for roof accessories.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of [uncoated aluminum] [stainless-steel] roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.

C. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.

D. Roof-Hatch Installation:

1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
2. Attach safety railing system to roof-hatch curb.
3. Attach ladder-assist post according to manufacturer's written instructions.

E. Seal joints with sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."

C. Clean exposed surfaces according to manufacturer's written instructions.

D. Clean off excess sealants.

E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 078100 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes sprayed fire-resistive materials (SFRM).

B. Related Requirements:

1. Section 078123 "Intumescent Fireproofing" for mastic and intumescent fire-resistive coatings.

1.2 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Evaluation reports.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

B. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Steel members are to be considered unrestrained unless specifically noted otherwise.

C. Asbestos: Provide products containing no detectable asbestos.

2.2 PRAYED FIRE-RESISTIVE MATERIALS

A. SFRM : Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Carboline Company; RPM International; Pyrolite 15.
    b. Grace Construction Products; W.R. Grace & Co. -- Conn; Grace Construction Products; Monokote MK-6 Series, or Grace Construction Products; Retro-Guard.
    c. Isolatek International, Inc; Cafco 300. or Cafco 300 SB.
    d. Pyrok, Inc; Pyrok-MD.
    e. Southwest Fireproofing Products Co; Type 5EF, or Type 5GP.

2. Bond Strength: Minimum 150-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E 736.
3. Density: Not less than 15 lb/cu. ft. and as specified in the approved fire-resistance design, according to ASTM E 605.
4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch.
5. Combustion Characteristics: ASTM E 136.
6. Surface-Burning Characteristics: Flame-spread and smoke-developed indexes of 10 or less according to ASTM E 84.
7. Compressive Strength: Minimum 10 lbf/sq. in. according to ASTM E 761.
8. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
9. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
11. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E 859.
12. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G 21 or rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273.
13. Fire-Resistance Rating: 2-hour for columns, beams, joists, and deck supporting floors. 1-hour for columns, beams, and joists supporting roofs. Reference Drawings for more information and applicable UL assemblies.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

B. Substrate Primers: Primers approved by fireproofing manufacturer.

C. Bonding Agent: Product approved by fireproofing manufacturer

D. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.

3.2 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.

B. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.

3.3 APPLICATION

A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, and other materials and procedures affecting fireproofing work.

B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Spray apply fireproofing to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.

D. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Test and inspect as required by the IBC, 1704.10.

B. Fireproofing will be considered defective if it does not pass tests and inspections.

1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

C. Prepare test and inspection reports.

3.5 LEANING AND REPAIRING

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

B. Repair fireproofing damaged by other work before concealing it with other construction.

C. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

D. END OF SECTION 078100

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule and Assembly Shop Drawings: For each penetration firestopping system assembly. Include location and design designation of qualified testing and inspecting agency.

1. Each application submitted shall be accurately marked to show the actual test/listed assembly to be provided, including the construction surrounding the penetration, sleeves, firestopping products and associated materials, and any options allowed and selected under the tested/listed assembly. The marking shall not use color highlighting and the data shall be marked to indicate materials and assembly options not applicable, by marking out such non-applicable (non-proposed) requirements, while still having the marked out item readable through the strike-out. If the submitted application is copied directly from a UL directory illustration or similar publication with small format lettering, enlarge the copy to be readable from a distance of 12 incles without magnification to the Architect’s satisfaction.
2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:

    a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
    b. Classification markings on penetration firestopping correspond to designations listed by the following:

        1) UL in its "Fire Resistance Directory."

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

C. Notify contractor's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. A/D Fire Protection Systems Inc.
2. Grace Construction Products.
3. Hilti, Inc.
4. Johns Manville.
5. Nelson Firestop Products.
6. NUCO Inc.
7. Passive Fire Protection Partners.
8. RectorSeal Corporation.
9. Specified Technologies Inc.
10. 3M Fire Protection Products.
11. Tremco, Inc.; Tremco Fire Protection Systems Group.
12. USG Corporation.

2.2 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Fire-resistance-rated walls include fire-barrier walls.
2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Horizontal assemblies include floors, roofs, and ceiling membranes of rated ceiling assemblies.

2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.

1. L-Rating: Not exceeding 5.0 cfm/sq.ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.

E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

G. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

H. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

I. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

1. Permanent forming/damming/backing materials, including the following:

a. Slag-wool-fiber or rock-wool-fiber insulation.
b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
c. Fire-rated form board.
d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.3 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Use of Pillows/Bags is not acceptable.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.4 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

C. Install fill materials for firestopping by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Engage a qualified testing agency to perform tests and inspections.

B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.

C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Latex joint sealants.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets
2. Division 07 Section "Expansion Control" for building expansion joints.
3. Division 07 Section "Fire-Resistive Joint Systems" for sealing joints in fire-resistance-rated construction.
4. Division 08 Section "Glazing" for glazing sealants.
5. Division 09 Section "Gypsum Board" for sealing perimeter joints.
6. Division 32 Section "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

B. Preconstruction Stain Testing, Silicone Sealants: Submit to joint sealant manufacturer for silicone sealants to be used in masonry, stone, and similar porous joints, the actual joint materials for testing in accordance with ASTM C124B, to determine whether the sealants to be used will cause staining of the surrounding joint materials. Schedule sufficient time for testing and analyzing results to prevent delaying the Work. For sealant materials failing tests, obtain joint sealant manufacturer' written requirements for the products and procedures to be used to result in no staining.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

D. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

E. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

D. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Final Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance, including non-staining of adjacent materials, and other requirements specified in this Section within specified warranty period.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

D. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

F. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant ES-1: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 791.
b. Pecora Corporation; 864.
c. Sika Corporation; Sika Sil 728NS
d. Tremco Incorporated; Spectrem 3.

B. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant ES-2: ASTM C 920, Type S, Grade P, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 890-SL.
b. Pecora Corporation; 300 SL.
c. Tremco Incorporated; Spectrem 900 SL.

2.3 LATEX JOINT SEALANTS

A. Latex Joint Sealant LS-1: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Pecora Corporation; AC-20+.
b. Tremco Incorporated; Tremflex 834.

2.4 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surface of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces (ES-1).

1. Joint Locations:

    a. Control and expansion joints in unit masonry
    b. Joints between metal panels.
    c. Joints between different materials listed above
    d. Perimeter joints between materials listed above and frames of doors, windows, and louvers

2. Silicone Joint Sealant: Single component, nonsag, neutral curing, Class 50.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces (ES-2).

1. Joint Locations:

    a. Isolation joints in cast-in-place concrete slabs.
    b. Control and expansion joints in tile flooring.

2. Silicone Joint Sealant: Single component, pourable, traffic grade, neutral curing.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces (LS-1).

1. Joint Locations:

a. Control and expansion joints on exposed interior surfaces of exterior walls.
b. Perimeter joints of exterior openings where indicated.
c. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
d. Perimeter joints between interior wall surfaces and frames of interior doors and windows.

2. Joint Sealant: Latex.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

D. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces (AS-1).

1. Joint Location:

a. Acoustical joints where indicated.

2. Joint Sealant: Acoustical.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 079200

SECTION 079513.13 - INTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes interior expansion joint cover assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.

B. Shop Drawings: For each expansion joint cover assembly.

1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
2. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.

C. Samples for Initial Selection: For each type of exposed finish.

1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric-seal material.

D. Expansion Joint Cover Assembly Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:

1. Manufacturer and model number for each expansion joint cover assembly.
2. Expansion joint cover assembly location cross-referenced to Drawings.
3. Nominal, minimum, and maximum joint width.
4. Movement direction.
5. Materials, colors, and finishes.
6. Product options.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Furnish units in longest practicable lengths to minimize field splicing.

B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.2 FLOOR EXPANSION JOINT COVERS

A. Metal-Plate Floor Joint Cover : Metal cover plate fixed on one side of joint gap and free to slide on other.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC
b. Balco, Inc.
c. Construction Specialties, Inc.
d. InPro Corporation (IPC)
e. MM Systems Corporation
f. Nystrom, Inc.
g. Watson Bowman Acme Corp.

3. Application: Floor to floor

a. Basis-of-Design: InPro; 801-A01-050.

4. Application: Floor to wall.

a. Basis-of-Design: InPro; 801-A02-050.

5. Installation: Surface mounted.
6. Load Capacity:

a. Uniform Load: 50 lb/sq. ft..
b. Concentrated Load: 300 lb .
c. Maximum Deflection: 0.0625 inch .

7. Cover-Plate Design: [Plain] [Serrated] [Abrasive covered].
8. Exposed Metal:

    a. Aluminum: Clear anodic, Class I .

2.3 WALL EXPANSION JOINT COVERS

A. Metal-Plate Wall Joint Cover : Metal cover plate fixed on one side of joint gap and free to slide on other.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:

a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
b. Balco, Inc.
c. Construction Specialties, Inc.
d. InPro Corporation (IPC).
e. Nystrom, Inc.
f. Watson Bowman Acme Corp.

3. Application: Wall to wall.

a. Basis-of-Design: InPro; 811-A07-050.

4. Application: Wall to corner.

a. Basis-of-Design: InPro; 811-A09-050.

5. Exposed Metal:

a. Aluminum: Clear anodic, Class I .

1) Color: As selected by Architect from full range of industry colors and color densities.

2.4 CEILING EXPANSION JOINT COVERS

A. Metal-Plate Ceiling Joint Cover : Metal cover plate fixed on one side of joint gap and free to slide on other.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide Inpro; 811-A09-050, or comparable product by one of the following:

a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
b. Balco, Inc.
c. Construction Specialties, Inc.
d. InPro Corporation (IPC).
e. MM Systems Corporation.
f. Nystrom, Inc.

3. Application: Wall to ceiling.
4. Exposed Metal:

a. Aluminum: Clear anodic, Class I .

1) Color: As selected by Architect from full range of industry colors and color densities.

B. Elastomeric-Seal Ceiling Joint Cover (at lay-in ceiling): Assembly consisting of elastomeric seal anchored to frames fixed to sides of joint gap.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Inpro; 115-A18-050, or comparable product by one of the following:

a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
b. Construction Specialties, Inc.
c. InPro Corporation (IPC).

2. Application: Wall to ceiling.

2.5 MATERIALS

A. Aluminum: ASTM B 221 , Alloy 6063-T5 for extrusions; ASTM B 209 , Alloy 6061-T6 for sheet and plate.

1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.

B. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.

2.6 ALUMINUM FINISHES

A. Mill finish.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

2.7 ACCESSORIES

A. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.

B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.

B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.

1. Repair or grout block out as required for continuous frame support using nonmetallic, shrinkage-resistant grout.
2. Install frames in continuous contact with adjacent surfaces.
    a. Shimming is not permitted.
3. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
4. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.
5. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

C. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.

1. Provide in continuous lengths for straight sections.
2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

D. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.

E. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.

3.4 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion joint cover assemblies. Reinstall cover plates or seals prior to Substantial Completion.

END OF SECTION 079513.13

SECTION 079513.16 - EXTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Exterior building expansion joint cover assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.

B. Shop Drawings: For each expansion joint cover assembly.

1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
2. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.

C. Samples for Initial Selection: For each type of exposed finish.

1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.

D. Expansion Joint Cover Assembly Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:

1. Manufacturer and model number for each expansion joint cover assembly.
2. Expansion joint cover assembly location cross-referenced to Drawings.
3. Nominal, minimum, and maximum joint width.
4. Movement direction.
5. Materials, colors, and finishes.
6. Product options.
7. Fire-resistance ratings.

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Build mockup of typical expansion joint cover assembly as shown on Drawings.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Furnish units in longest practicable lengths to minimize field splicing.

B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Expansion joint cover assemblies shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Fire-Resistance Ratings: Provide expansion joint cover assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 or ASTM E 1966 by a qualified testing agency.

1. Hose Stream Test: Wall-to-wall and wall-to-soffit assemblies shall be subjected to hose stream testing.

C. Expansion Joint Design Criteria :

1. Type of Movement: Thermal.

a. Nominal Joint Width: 1-inch.

2.3 EXTERIOR EXPANSION JOINT COVERS

A. Exterior Metal-Plate Joint Cover : Assembly consisting of sliding metal cover plate in continuous contact with gaskets mounted on metal frames fixed to sides of joint gap.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
b. Balco, Inc.
c. Construction Specialties, Inc.
d. InPro Corporation (IPC).
e. Nystrom, Inc.
f. Watson Bowman Acme Corp.

3. Application: Wall to wall.
4. Installation: Surface mounted.
5. Exposed Metal:

a. Stainless steel: No. 4.

B.

1. Application: Wall to wall (corner).

2. Seal: Preformed elastomeric membrane or extrusion.

2.4 |MATERIALS

1.

B. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304 for plates, sheet, and strips.

C. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.

D. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to comply with performance criteria for required fire-resistance rating.

E. Moisture Barrier: Manufacturer's standard, flexible elastomeric material.

"Color Anodic Finish" Paragraph below. Verify availability with manufacturers.

2.6 STAINLESS-STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.
2. Directional Satin Finish: No. 4.

2.7 ACCESSORIES

A. Moisture Barriers: Manufacturer's standard continuous, waterproof membrane within joint and attached to substrate on sides of joint.

1. Provide where indicated on Drawings.

B. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.

B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

C. Surface Cleaning of Joints: Clean out joints immediately before installing preformed joint seals to comply with preformed joint seal manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of preformed joint seal, including dust, paints (except for permanent protective coatings tested and approved for seal adhesion and compatibility by seal manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimal bond with preformed joint seals. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Masonry.

3. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint seals. Nonporous joint substrates include the following:

    a. Metal.

D. Joint Priming: Prime joint substrates where recommended by preformed joint seal manufacturer or as indicated by tests or prior experience. Apply primer to comply with joint seal manufacturer's written instructions. Confine primers to areas of joint seal bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.

B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.

1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.
3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
4. Install frames in continuous contact with adjacent surfaces.

    a. Shimming is not permitted.

5. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

C. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.

1. Provide in continuous lengths for straight sections.
2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

D. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.

E. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.

F. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion joint cover assembly materials and associated work so complete assemblies comply with performance requirements.

1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

G. Moisture Barrier Drainage: If indicated, provide drainage fitting and connect to drains.

3.4 CONNECTIONS

A. Transition to Roof Expansion Joint Covers: Coordinate installation of exterior wall and soffit expansion joint covers with roof expansion joint covers . Install factory-fabricated units at transition between exterior walls and soffits and roof expansion joint cover assemblies.

3.5 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections.

END OF SECTION 079513.16

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal doors and frames.
2. Storm rated hollow metal doors and frames.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section “Door Hardware” for door hardware for hollow metal doors.
3. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.
4. Division 26 Sections for electrical connections including conduit and wiring for door controls and operators.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

C. Custom Hollow Metal Work: Hollow metal work fabricated according to ANSI/NAAMM-HMMA 861.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.
10. Fire rated doors and frames showing conformance with NFPA 80 and Underwriters Laboratory, Inc.

C. Other Action Submittals:

1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

1.4 INFORMATIONAL SUBMITTALS

A. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.

1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.

C. Smoke-Control Door Assemblies: Comply with NFPA 105 or UBC Standard 7-2.

D. FEMA 361 Design and Construction Guidance for Community Shelters.

E. Steel door Institute ANSI/SDI-A50.13 Testing and Rating of Sever Windstorm Resistant Components for Swing Door Assemblies.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amweld Building Products, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.
4. Fleming Door Products Ltd.; an Assa Abloy Group company.
5. Steelcraft; an Ingersoll-Rand company.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.

D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

G. Glazing: Comply with requirements in Division 08 Section "Glazing."

H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL DOORS

A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.

1. Design: Flush panel with seamless vertical edges.
2. Core Construction: Manufacturer's standard vertical steel-stiffener core. Stiffners to be welded to faces. Provide with voids filled with mineral wool insulation.

    a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

    b. Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 12.3 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

        1) Locations: Exterior doors and interior doors where indicated.

3. Vertical Edges for Single-Acting Doors: Beveled edge.

    a. Beveled Edge: 1/8 inch in 2 inches.

4. Vertical Edges for Double-Acting Doors: Round vertical edges with 2-1/8-inch radius.
5. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick, end closures or channels of same material as face sheets. Top closures for outswing exterior wall doors shall be flush to eliminate possibility of catching water.
6. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless). Exterior door faces minimum 16 gage (0.067 inch).

C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet[unless metallic-coated sheet is indicated]. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless). Interior door faces minimum 16 gauge (0.067 inch).

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

1. When vertical steel stiffeners are used for core construction, fill spaces between stiffeners with mineral fiber insulation.

F. Fire Rated Doors (labeled)

1. Conform to NFPA 80 when tested by Underwriters Laboratories, Inc., for the class of door or opening shown.
2. Fire rated labels of metal, with raised or incised markings of approving laboratory shall be permanently attached to doors.
3. Close top and vertical edges of doors flush. Vertical edges shall be seamless. Apply steel astragal to the meeting stile of the active leaf of pairs of fire rated doors, except where vertical rod exit devices are specified for both leaves swinging in the same direction.

2.4 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated from metallic-coated steel sheet.

1. Fabricate frames with mitered or coped corners.
2. Fabricate frames as full profile welded unless otherwise indicated.

C. Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.

1. Fabricate frames with mitered or coped corners.
2. Fabricate frames as full profile welded unless otherwise indicated.
3. Frames for Level 3 Steel Doors: 0.067-inch- thick steel sheet. 0.075-inch- for frames exceeding 48 inches in width.
4. Frames for Wood Doors: 0.067-inch- thick steel sheet. 0.075-inch- for frames exceeding 48 inches in width.
5. Frames for Borrowed Lights: 0.067-inch- thick steel sheet. 0.075-inch- for frames exceeding 48 inches in width.

D. Frames for labeled fire rated doors.

1. Comply with NFPA 80. Test by Underwriters Laboratories, Inc.
2. Fire rated labels of approving laboratory permanently attached to frames as evidence of conformance with these requirements. Provide labels of metal or engraved stamp, with raised or incised markings.

E. Knocked Down frames are **NOT** acceptable.

F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

G. Frames for Storm Shelter Doors:

1. 14 gauge minimum.
2. Frames shall be bolted to concrete with masonry type anchor as well as post installed expansion anchors at 18 inches O.C. minimum, 'bondo' bolt heads

2.5 FEMA 361 STEEL DOORS AND FRAMES FOR SHELTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Manufacturers listed below produce either standard or custom hollow metal work unless otherwise indicated. Verify specific capabilities with individual manufacturers.

1. Ceco Door Products; an Assa Abloy Group company.
2. Curries Company; an Assa Abloy Group company.
3. Fleming Door Products Ltd.; an Assa Abloy Group company.

B. FEMA Rated Hollow Metal Doors:

1. Shelter entry doors and their frames shall resist the design wind pressures for components and cladding as described FEMA 361, 2015 edition & ICC 500-2015. Only single opening and paired opening doors, and their frames that can resist calculated design wind pressures and laboratory tested missile impacts are acceptable.
2. All doors shall have sufficient points of connection to their frame to resist design wind pressure and impact loads.
3. A protective missile resistant barrier is permitted to protect the door opening. The door should then be designed to resist wind pressures. The size and number of shelter doors shall be determined in accordance with applicable fire safety and building codes. In the event the community where the shelter is to be located has not adopted current fire safety and building codes, the requirements of the most recent editions of a model fire safety and a building code shall be used.
4. Sheets are to be made of commercial quality hot dipped zinc coated steel that complies with ASTM A924 A60.
5. Vertical edges will join the face sheets by a continuous weld extending the full height of the door. Welds are to be ground and filled to make them invisible and provide a smooth flush surface.
6. Hinge reinforcement to be not less than 7 gage (3/16") plate 1-1/4" x 9" prepared for 4-1/2 x 4-1/2 x .180 hinges.
7. Reinforce tops and bottoms of all doors with an inverted continuous steel channel not less than 16 gage, extending the full width of the door and welded to the face sheet. Doors shall have a steel closure channel welded in place so the web of the channel is flush with the top of the face sheets of the door. Plastic fillers are NOT acceptable.
8. Door systems, both single doors and paired openings, shall be tested and must comply with the FEMA 361 Design and Construction Guidance for Community Shelters and have available verifiable third party conformance test results.

C. FEMA Rated Hollow Metal Frames:

1. To be 14-gauge hot dipped zinc coated steel that complies with ASTM designations A924 A60.
2. All frames are to be assembled so that the face miter seam is "closed and tight". Weld the face seam, grind and dress the weld area smooth. Apply a zinc rich primer over the grinding area, and finish with a matching prime paint.
3. Frame assembly for single doors and paired openings, shall be tested and must comply with the FEMA 361-2015 Design and Construction Guidance for Community Shelters and have available verifiable third party conformance test results.

D. Fabrication:

1. Provide steel frames for doors to the size and design as shown on the architectural drawings.
2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects.

3. Jamb depths, trim, profile and backbends to be as scheduled and shown on approved shop drawings.
4. Hardware reinforcements shall be in accordance with the minimum standard gages as listed in SDI-100.
5. Frames shall be mortised, reinforced, drilled and tapped at the factory for template mortised hardware only, in accordance with approved hardware schedule and template provided by the hardware contractor. Where surface mounted hardware is to be applied, frames shall have reinforcing plates only, all drilling and tapping to be done in the field by others.
6. Hinge reinforcement to be not less than 7 gage (3/16") plate prepared for 4-1/2 x 4-1/2 x .180 hinges.

E. Anchors:

1. Anchors for masonry walls to be of the masonry "T"type, Wire masonry type, or Existing Opening anchors. 5 wall anchors per jamb: 4• max from each end of door opening height and equally spaced. 4 wall anchors per head on pairs, 6 inches maximum from each end of door opening and 2 at 6 inches from each side of head centerline on pairs, and 2 wall anchors per head: 6 inchesmax from each end of opening width for singles.
2. Dust boxes/mortar guards to be no less than 26 gage.
3. All frames that are to be welded are to have a steel spreader during shipping and handling. Spreader bars are for bracing only and are not be used to size the frame opening.
4. Punch the stop for 3 silencers on single door and 2 on double door frames unless otherwise noted in Division 08 Section "Door Hardware."

2.6 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Where floor fills occur, provide extension type floor anchors to compensate for depth of fill.
3. At bottom of jamb use 1.3mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive two 6 mm (1/4 inch) floor bolts. Use 50 mm x 50 mm (2 inch by 2 inch)9 mm by (3/8 inch) clip angle for lead lined frames, drilled for 9 mm (3/8 inch) floor bolts.
4. Where mullions occur, provide 2.3 mm (0.093 inch) thick steel channel anchors, drilled for 6mm (1/4 inch) floor bolts and frame anchor screws.
5. Where sill sections occur, provide continuous 1 mm (0.042 inch) thick steel rough bucks drilled for 6mm (1/4 inch) floor bolts and frame anchor screws. Space floor bolts at 50 mm (24 inches) on center.

2.7 STOPS AND MOLDINGS

A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.

B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- wide steel.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

D. Grout Boxes: Formed from same materials as frames at locations indicated to receive installation of electrical conduit for power or data wiring.

2.9 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

C. Hollow Metal Doors:

1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
2. Glazed Lites: Factory cut openings in doors.
3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Seamless Edges: Provide seamless edges by intermittently tack welding edges, grinding, filling gaps and finishing free from blemishes, unless otherwise indicated

D. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Provide continuous steep strap tack welded in head of frames which are wider then 72-inches in opening width.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
5. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
6. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
7. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

    b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Three anchors per jamb up to 60 inches high.
        2) Four anchors per jamb from 60 to 90 inches high.
        3) Five anchors per jamb from 90 to 96 inches high.
        4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
        5) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.

    c. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

8. Door Silencers: Except on weather-stripped doors, or otherwise indicated to have an alternative type seal, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.

3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

G. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow metal work.
5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.10 STEEL FINISHES

A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:

1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-protection-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable glazing stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

7. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
8. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

    a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
    b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
    d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors according to NFPA 105.

D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory fitting flush wood doors.

B. Related Requirements:

1. Section 088000 "Glazing" for glass view panels in flush wood doors.
2. for field finishing doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, include details of core and edge construction and trim for openings. Include factory finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking for hardware attachment.
2. Dimensions and locations of mortises and holes for hardware.
3. Clearances and undercuts.
4. Requirements for veneer matching.
5. Doors to be factory finished and application requirements.
6. Fire-protection ratings for fire-rated doors.

C. Samples for Initial Selection: For factory-finished doors.

D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

B. Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors[and frames] that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors[and frames].

3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturers: Subject to compliance with requirements, provide products by VT industries, or comparable products by one of the following:

1. Algoma Hardwoods, Inc.
2. Eggers Industries
3. Graham Wood Doors; an Assa Abloy Group company
4. Marshfield Door Systems, Inc.
5. VT Industries, Inc.

B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

1. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.

B. WDMA I.S.1-A Performance Grade: Heavy Duty

C. Fire Rated Wood Doors: Doors complying iwth NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection rating indicated, based on testing at positive pressure according to NFPA 252.

1. Oversize FIre Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard consturciton requirements for tested and labeled fire rated door assemblies except for size.
2. Temperature Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-tested exposure.
3. Cores: Provide core specified or mineral core as needed to provide fire protection rating indicated.
4. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
5. Pairs: Provide fire retardant stiles that are listed and labeled for applications indicated without formed steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

D. Smoke and Draft Control Door Assemblies: Listed and labeled for smoke and draft control, based on testings according to UL 1784.

E. Particleboard core doors

1. Particleboard: ANSI A208.1, Grade LD-2
2. Blocking: Provide wood blocking in particleboard core doors as follows:

    a. 5 inch top rail blocking, in doors indicated to have closers.
    b. 5 inch bottom rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.

3. Provide doors with glued wood stave or structural composite lumber cores instead of particleboard cores for doors indicated to receive exit devices.

F. Mineral Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire protection rating indicated.
2. Blocking: Provide composite blocking with improved screw holding capability approved for use in doors of fire protection ratings indicated as follows:

    a. 5 inch top rail blocking
    b. 5 inch bottom rail blocking, in doors indicated to have protection plates.
    c. 5 inch midrail blocking, in doors indicated to have armor plates.
    d. 5 inch midrail blocking, in doors indicated to have exit devices.

3. Edge Construction: At hinge stiles, provide laminated edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

    a. Screw Holding Capability: 475 lbf per WDMA T.M.-10

2.3 VENEER FACED DOORS AND TRANSPARENT FINISH

A. Interior Solid Core Doors

1. Grade: Premium with Grade A faces
2. Species: Red Oak
3. Cut: Plain sliced (flat)
4. Match between Veneer Leaves: Book match
5. Assembly of Veneer Leaves on Door Faces: Running match
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Exposed Vertical and Top Edges: Same species as faces - edge Type A.
8. Core: Particleboard
9. Construction: Five plies. Stiles and rails are conded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
10. WDMA I.S.1-A Performance Grade: Heavy Duty

2.4 LIGHT FRAMES AND LOUVERS

A. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated on Drawings.

2.5 FABRICATION

A. Factory machine doors for hardware that is not surface applied.

1. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.

B. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.6 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises.
2. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:

1. Grade: Premium.
2. Finish: WDMA I.S. 1A TR-6 Catalyzed Polyurethane.
3. Staining: Match Architect's sample.

4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.

5. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire rated doors according to NFPA 80.
2. Install smoke and draft control doors according to NFPA 105.

C. Job-Fitted Doors:
1. Clearances:

a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
c. Where threshold is shown or scheduled, provide1/4 inch from bottom of door to top of threshold unless otherwise indicated.

d. Comply with NFPA 80 for fire-rated doors.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes access doors and frames for walls and ceilings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details[, fire ratings,] material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches in size.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection[and temperature-rise limit] ratings indicated, according to NFPA 252 or UL 10B.

2.2 ACCESS DOORS AND FRAMES

A. Flush Access Doors with Concealed Flanges Where occur in un-rated gypsum wallboard walls or ceilings.:

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

   a. Babcock-Davis.
   b. JL Industries, Inc.; a division of the Activar Construction Products Group.
   c. Karp Associates, Inc.
   d. Larsens Manufacturing Company.
   e. MIFAB, Inc.
   f. Milcor; Commercial Products Group of Hart & Cooley, Inc.
   g. Nystrom, Inc.

2. Description: Face of door flush with frame; with concealed flange for gypsum board installation and concealed hinge.
3. Locations: Wall and ceiling.
4. Door Size: <20" x 24", 18" x 18" or as indicated on the drawings.>.
5. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch, 16 gage factory primed.

6. Frame Material: Same material and thickness as door.
7. Latch and Lock: Prepared for mortise cylinder.

2.3 FIRE-RATED ACCESS DOORS AND FRAMES

A. Fire-Rated, Flush Access Doors with Concealed Flanges Where occur in rated gypsum wallboard walls or ceilings:

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

    a. Babcock-Davis.
    b. JL Industries, Inc.; a division of the Activar Construction Products Group.
    c. Karp Associates, Inc.
    d. MIFAB, Inc.
    e. Nystrom, Inc.

2. Description: Door face flush with frame, uninsulated; with concealed flange for gypsum board installation, self-closing door, and concealed hinge.
3. Locations: Wall and ceiling.
4. Door Size: 20" x 24", 18" x 18" or as indicated in the drawings..
5. Fire-Resistance Rating: Not less than that of adjacent construction.

6. Temperature-Rise Rating: 450 deg F at the end of 30 minutes.
7. Uncoated Steel Sheet for Door: , factory primed.

8. Frame Material: Same material, thickness, and finish as door.

9. Latch and Lock: Self-closing, self-latching door hardware, prepared for mortise cylinder.

2.4 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.

D. Aluminum Extrusions: ASTM B 221, Alloy 6063.

E. Frame Anchors: Same material as door face.

F. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.5 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.

D. Latch and Lock Hardware:

1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
2. Keys: Furnish two keys per lock and key all locks alike.
3. Mortise Cylinder Preparation: Where indicated, prepare door panel to accept cylinder specified in Section 087100 "Door Hardware."

2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 FIELD QUALITY CONTROL

A. Inspections:

1. Fire-Rated Door Inspections: Inspect each fire-rated access door in accordance with NFPA 80, section 5.2.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

D. Prepare and submit separate inspection report for each fire-rated access door indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Exterior storefront framing.
2. Exterior manual-swing entrance doors and door-frame units.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:

1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
2. Dimensional tolerances of building frame and other adjacent construction.
3. Failure includes the following:

a. Deflection exceeding specified limits.
b. Thermal stresses transferring to building structure.
c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.

d. Noise or vibration created by wind and by thermal and structural movements.
e. Loosening or weakening of fasteners, attachments, and other components.
f. Sealant failure.
g. Failure of operating units.

B. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Structural Loads:

1. Wind Loads:

a. Basic wind speed: 90 mph.
b. Importance factor: 1.15.
c. Exposure category: C.

D. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.

2. Deflection Parallel to Glazing Plane: Limited to L/360 of clear span or 1/8 inch, whichever is smaller.

E. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.

F. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft..

G. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

H. Water Penetration under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

1. Maximum Water Leakage: No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior and water that cannot damage adjacent materials or finishes.

I. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.

    a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
    b. Low Exterior Ambient-Air Temperature: 0 deg F.

3. Interior Ambient-Air Temperature: 75 deg F.

J. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.

K. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than 0.57 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.

L. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:

1. Sound Transmission Class (STC): Minimum 35 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.

B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.

1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.

2. For entrance doors, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Delegated-Design Submittal: For aluminum-framed systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of aluminum-framed systems.
2. Include design calculations.

E. Qualification Data: For qualified Installer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.

G. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.

C. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

D. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

E. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Noise or vibration caused by thermal movements.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
d. Water leakage through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: Two years from date of Final Completion.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.

1. Warranty Period: 10 years from date of Final Completion.

1.8 MAINTENANCE SERVICE

A. Entrance Door Hardware:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. EFCO Corporation.
2. Kawneer North America; an Alcoa company.
3. Tubelite.
4. YKK AP America Inc.
5. Manko Window Systems, Inc.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Sheet and Plate: ASTM B 209.
2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
3. Extruded Structural Pipe and Tubes: ASTM B 429.
4. Structural Profiles: ASTM B 308/B 308M.
5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

A. Exterior Frames: Basis of Design

B. EFCO, 403 Series, Thermally Broken, Center Glazed (2” x 4 1/2”)

C. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Full Thermally broken at exterior locations; non-thermally broken at interior locations.
2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Front set on Exterior Frames, Center Set on Interior Frames.

D. Sheet Panning: Manufacturer's standard sheet and plant aluminum, minimum .125 inch thickness.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

F. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

G. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

H. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

2.4 GLAZING SYSTEMS

A. Glazing: As specified in Division 08 Section "Glazing."

B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

2.5 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.

1. Door Construction: 2-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
b. Basis of Design

2. D502 Series Heavy Duty – Heavy Wide Style Swing door (2")

3. Door Design: Wide stile; 5-inch nominal width.

   a. Accessible Doors: Smooth surfaced for width of door in area within 12 inches above floor or ground plane.
   b. Provide 5-inch mid rail and 10-inch bottom rail

4. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

   a. Provide nonremovable glazing stops on outside of door.

B. Entrance Door Hardware: As specified in Division 08 Section "Door Hardware."

2.6 ACCESSORY MATERIALS

A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."

B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil thickness per coat.

C. Bent Plates & Flashing as detailed on drawings.

1. Material: Aluminum
2. Match finish of adjacent aluminum frames.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
4. Physical and thermal isolation of glazing from framing members.
5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
6. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

C. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

D. Storefront Framing: Fabricate components for assembly using screw-spline system.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At exterior doors, provide compression weather stripping at fixed stops.
2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M10C22A44, Class I, 0.018 mm or thicker.

1. Color: Match exterior aluminum framing color currently in place in the building.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.

2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

C. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

E. Install glazing as specified in Division 08 Section "Glazing."

F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

G. Install perimeter joint sealants as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.

3.3 ERECTION TOLERANCES

A. Install aluminum-framed systems to comply with the following maximum erection tolerances:

1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
2. Alignment:

a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.

B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

3.4 FIELD QUALITY CONTROL

A. Repair or remove work if test results and inspections indicate that it does not comply with specified requirements.

B. Aluminum-framed assemblies will be considered defective if they do not pass tests and inspections.

3.5 ADJUSTING

A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer.

1. For entrance doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch, measured to the leading door edge.

END OF SECTION 084113

SECTION 087100 - FINISH HARDWARE

1.1 RELATED DOCUMENTS

A. AS: set forth in the headings of General Conditions, Supplementary General Conditions and Division 1, General Requirements shall apply to this branch of the Work.

1.2 SUMMARY

B. Intent: The intent of this Section is to provide finish hardware for the proper operation and control of all wood, hollow metal and aluminum doors in the Project. Prior to bidding, notify the Architect of any doors that do not have hardware meeting this intention.

C. This Section includes known commercially, as finish or door hardware that are required for swing, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed. This Section includes, but is not necessarily limited to furnishing and installing complete, the following:

1. Finish hardware for proper operation, function, control and protection of all doors, as required.

C Related sections:

1. Hollow metal doors; frames and silencers
2. Wood doors.
3. Aluminum doors.

1.3 SUBMITTALS

A. Comply with requirements of the Conditions of the Contract.

B. Product Data: Submit manufacturer’s technical product data for each hardware item. Include information necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finishes.

C. Hardware Schedule: Submit a hardware schedule in a vertical format (horizontal format not acceptable), organized into sets, including the information below. Designations for door numbers and hardware sets in the schedule shall match those used in the Construction Documents.

1. Hardware Schedule shall be coordinated with doors, frames, and related work to ensure proper size, thickness, hand function, and finish of door hardware. Provide index at end of submittal listing door and-specified hardware. In addition, indicate page on submittal where door is found.
2. Catalog cuts of each type of exposed hardware unit, highlighted in color to indicate compliance with the Hardware Schedule.
    a. Type, style, function, size send finish of each hardware item.
    b. Name and manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
    e. Mounting locations for hardware.
    f. Door and frame sizes and materials.
    g. Deviations from Specifications shall be noted in cover letter.

D. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames), which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

E: Keying Schedule: Submit separate detailed schedule indicating keying for all locks. Keying schedule must be approved before ordering any locks.

1. Use ANSI A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
2. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
3. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
4. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
5. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work. To be factory-prepared for the installation of hardware: Upon request check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1.4 QUALITY ASSURANCE

A. Supplier Qualifications: A recognized Architectural Finish Hardware Supplier, with warehousing facilities, who has been furnishing hardware in the Project's vicinity for a period of not less than two (2) years. Supplier shall be or employ an experienced Architectural Hardware Consultant (AHC) who is certified by and member of the Door and Hardware Institute. The Architectural hardware Consultant shall be available, at reasonable times during the course of the work, for consultation about Project's hardware requirements, to Owner, Architect and Contractor.

B. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80, No. 101 and local building code requirements. Provide only hardware, which has been tested and listed, by UL, FM or Warnock Hersey for types and sizes of doors required and complies with requirements of door and door frame labels.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware".

C. Standards: Comply with the requirements of the latest edition of the following standards, unless indicated otherwise:

1. American National Standards Institute (ANSI) Publications:
   a. A115 Series - Door and Frame Preparation
   b. A156 Series -Hardware
2. Builders Hardware Manufacturers Association (BHMA) Publications:

a. 1201- Auxiliary Hardware
b. 1301 - Materials and Finishes

3. Door and Hardware Institute (DHI) Publications:

a. Keying - Procedures, Systems, and Nomenclature
b. Abbreviations and Symbols
c. Hardware for Labeled Fire Doors
d. Recommended Locations for Builder's Hardware for Standard and Custom Steel Doors and Frames
e. Wood Door Standards W1, W2, WDHS-2 WDHS-3

4. National Fire Protection Association (NFPA) Publications:

a. NFPA Pamphlet No. 80 - Standards for Fire Doors and Windows.
b. NFPA Pamphlet No. 101.

5. International Building Code, Current edition adopted.

6. Americans with Disabilities Act (ADA).

1.5 DELIVERIES, STORAGE AND HANDLING

A. Package each hardware item in separate containers with all screws, wrenches, installation instructions and installation templates. Mark each box with hardware heading and door number according to approved hardware schedule.

B. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation: Provide a complete packing list showing items, door numbers and hardware headings with each shipment.

C. Store hardware in shipping cartons above ground and under cover to prevent damage. Provide secure lockup for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable -so that completion of the Work will not be delayed by hardware losses both before and after installation.

D. Aluminum Door Hardware: Deliver hardware for aluminum doors as directed by the door supplier.

E. Deliver keys and permanent high security cores to Owner by registered mail or overnight package service.

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system, and building control system, as applicable.

PART 2 - PRODUCTS

2.1 HARDWARE - GENERAL

A. Provide the materials or products indicated by trade names, manufacturer's name, or catalog number. Substitutions will not be permitted except as described in 01630.

B. Provide manufacturer's standard products meeting the design intent of this Specification, free of imperfections affecting appearance or serviceability.

1. Provide hardware complete with all fasteners, anchors, instructions, layout templates, and any specialized tools as required for satisfactory installation and adjustment.
2. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
3. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated or approved. Finish screws exposed under any condition to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible. Use machine screws for metal connections and wood screws for connections to wood. Use manufacturer's screws to secure hardware.
4. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt, head or nut on opposite face is exposed in other work, except where indicated otherwise or where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
5. Special Tools: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

C. Hardware is specified in the hardware schedule by set, type, and functions, which have been selected as best meeting the application requirements. Acceptable products for each category are specified in Paragraph 2.5, "Hardware Products".

2.2 SPECIAL REQUIREMENTS

A. Hinges:

1. Provide non-removable pins for all exterior doors. Use nonrising pins for all other doors.
2. Provide continuous hinge at interior or exterior doors where specified.

B. Locksets:

1. Locksets to be Grade 1 cylindrical unless otherwise specified.
2. Provide levers with vandal resistant technology for use at heavy traffic or abusive applications. Levers feature internal lock components that prevent damage caused by excessive force from persons kicking, hitting or standing on the lever to gain access.
3. Provide mortise locksets with inside visual indicator at classrooms and other locations a specified.

C. Multipoint Locksets:

1. Locksets shall meet or exceed ANSI Grade 1 requirements.
2. Provide windstorm rated three-point locking system as part of integrated assembly including door, frame, and hardware.

D. Exit Devices:

1. Latchbolts to be deadlatching type.
2. Exit devices are to incorporate a flush and tapered end cap.

3. Touchbars must be stainless steel. Touchpad shall extend a minimum of one half of the door width, but not the full length of the exit device rail.
4. Hardware mullions are to be of the same manufacturer as the panic device. Provide keyed mullions unless otherwise specified. Provide mullion storage kits where specified.
5. Provide windstorm rated panic devices where specified.
6. Devices are not to incorporate the use of surface mounted floor strikes.
7. Provide electrical options as specified.

E. Closers:

1. Comply with manufacturer's recommendations for unit size based on door size, weather exposure and usage.
2. Provide parallel arms for all overhead closers, except as otherwise indicated.
3. Through-bolt all closer units, using sex bolt fasteners.
4. Closers UL Certified to be in compliance with UBC 7.2 and UL 10C.
5. Closers with Pressure Relief Values will not be acceptable.
6. Provide drop plates and mounting brackets for closers if required.

F. Thresholds and Gasketing

1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
3. Gasketing and astragals on aluminum frames by door manufacturer.
4. Smoke seal and intumescent seal is to be provided as required on fire labeled openings.

G. Stops

1. Provide heavy duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide overhead stop for interior doors that swing more than opens against equipment, casework, sidelights, and where conditions do not allow wall stop.

H. Silencers

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.3 Keying

A. Cylinders and cores: Cylinders shall be keyed to the existing Best master key system. Keying Schedule must be approved by the Owner prior to ordering any locks.

B. Provide keys as follows:
1. Change Keys: 2 per lock.
2. Permanent Control Keys: 3.
3. Master Keys: 6 required (per system).

C. Identification: Stamp all (master-type) keys with the following:
1. Do Not Duplicate.
2. Key change number (all keys).

2.4 HARDWARE FINISHES

A. Provide matching finishes for hardware units at each door to the greatest extent possible, unless otherwise indicated. In general, match items to the finish for the latch, lock or push pull unit for color and texture.

B. Hardware finishes as follows:

1. 626 - Satin Chrome-plated.
2. 630 - Satin Stainless Steel

2.5 HARDWARE PRODUCTS

ITEM	SPECIFIED	APPROVED EQUAL
Cont. Hinge	Ives	Select, Roton
Hinges	Ives	Bommer, Hager, Stanley
Locksets	Best 9K Series	No Substitution
Multi-Point Locks	Schlage LM Series	No Substitution
Panics	Von Duprin 99 Series	No Substitution
Closers	LCN 4040XP Series	No Substitution
Flatgoods	Ives	Burns, Rockwood
Stops	Ives	Burns, Rockwood
Thresholds	Zero	National Guard, Reese
Weatherstrip	Zero	National Guard, Reese

PART 3 - EXECUTION

3.1 PREPARATION

A. Carefully inspect doors, and conditions under which hardware will be installed. Notify the Architect of any conditions that would adversely affect the installation or subsequent door operation. Do not proceed until unsatisfactory conditions are corrected.

B. Refer to Section 08111 and 08410 for installation requirements.

1. Prior to hardware installation, the General Contractor shall setup a meeting with the Hardware Supplier and the Hardware installer to ensure the installer has and understands the manufacturers installation requirements for all hardware items.
2. The Supplier shall observe the installation of the first lockset, closer, and exit device.

3.2 INSTALLATION

A. Mount Hardware units at heights indicated in respective DHI Standards, except as specifically indicated, or required to comply with governing regulations, and except as may be otherwise directed by the Architect.

B. Install each hardware item in compliance with the manufacturer’s instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces, which are later to be field, finished, coordinate removal, storage and reinstallation or application of surface protections with finishing work. Do not install surface-mounted items until finishes have been completed on substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachments substrate as necessary for proper installation and operation.

D. Provide fasteners and anchoring devices of suitable size, quantity and type to secure hardware in proper position for heavy use and long life. Use manufacturers supplied or recommended fasteners.

1. Drill and countersink unit, which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Adjust door closers immediately upon installation. Adjust in exact conformance with manufacturer's printed instructions. Advance backcheck to eliminate shock at dead stop. Set closer latching speed to assure unassisted positive latching.

1. Degree of swing of door for self-limiting closers shall be maximum available.

F. Adjust all exit devices immediately upon installation. Adjust in exact conformance with manufacturers' printed instructions.

G. Install each protection plate with a thinly spread of mastic at its center to assure even contact before fastening with screws. Install all such plates on visual center of closed doors. Set bottom edges of all such plates flush with door bottom.

H. Seal weather protection components attached to the exterior sides of doors and frames, such as drip caps and weather-stripping, in place with clear silicone caulk in such a manner as to ensure a continuously filled seam throughout the joinery.

I. Cut and fit weatherstripping accurately to provide the greatest possible continuity of the contact element. Adjust closer template as required.

3.3 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units, which cannot be adjusted to operate freely and smoothly as intended for the applications made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.4 INSTRUCTIONS AND INSPECTIONS

A. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

B. After hardware is installed and adjusted, the Supplier shall inspect the job with the Architect and the General contractor to determine if the hardware is functioning properly.

1. Maintain the instruction sheets, layout templates, and any supplementary literature regarding hardware in a readable condition. Transmit all such items to the Owner's Representative, together with all spare parts, specialized tools, other accessories supplied with the hardware, and a copy of the approved hardware schedule at the time of instruction.

3.5 HARDWARE SCHEDULE

A. Refer to Part 4 for Door Hardware Schedule.

B. The hardware sets listed below represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process.

PART 4 - HARDWARE SCHEDULE

HARDWARE SET 01

DOOR NUMBER:
106 117 A102

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY EPT	628	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-99-DT-CON	626	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-NL-CON	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	RIM CYLINDER	1E72	626	BES
1	EA	CYLINDER	1E74	626	BES
2	EA	SURFACE CLOSER	4040XP SHCUSH	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA	689	LCN
2	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
2	EA	BLADE STOP SPACER	4040XP-61	689	LCN
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
2	EA	DOOR SWEEP	328AA	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
2	EA	WIRE HARNESS	CON (VERIFY LENGTH REQUIRED)		SCH
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	POWER SUPPLY	BY ACCESS CONTROL PROVIDER		
1	EA	CARD ACCESS	BY ACCESS CONTROL PROVIDER		
	EA	NOTE	WEATHERSTRIP BY DOOR MANUFACTURER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

HARDWARE SET 02

DOOR NUMBER:
121
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	99-EO	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

HARDWARE SET 03

DOOR NUMBER:
105 A102A
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	628	IVE
2	EA	DUMMY PUSH BAR	330-DT-990	626	VON
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA	689	LCN
2	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
2	EA	BLADE STOP SPACER	4040XP-61	689	LCN
	EA	NOTE	WEATHERSTRIP BY DOOR MANUFACTURER		

HARDWARE SET 04

DOOR NUMBER:
A101
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCKSET	93K 7D 15D S3 LM	626	BES
1	EA	SURFACE CLOSER	4040XP RW/PA	695	LCN
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR BOTTOM	355AA	AA	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE SET 05

DOOR NUMBER:
105A
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	9927-EO-F-LBR-499F	626	VON
1	EA	FIRE EXIT HARDWARE	9927-L-F-LBR-06-499F	626	VON
1	EA	RIM CYLINDER	1E72	626	BES
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	ASTRAGAL (SET)	8193AA	AA	ZER

HARDWARE SET 06

DOOR NUMBER:
102
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCKSET	93K 7D 15D S3 LM	626	BES
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE SET 07

DOOR NUMBER:
119
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ENTRANCE LOCK W/INDICATOR	45H 7AB 15S VIT	626	BES
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE SET 08

DOOR NUMBER:

101	107	108	109	110	111
112	113	114	115	116	

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ENTRANCE LOCK W/INDICATOR	45H 7AB 15S VIT	626	BES
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE SET 09

DOOR NUMBER:

118

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	93K 0L 15D S3 LM	626	BES
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET 10

DOOR NUMBER:

103 104

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

DOOR/HARDWARE INDEX

Mark #	HWSet #
MIDDLE SCHOOL	
101	08
102	06
103	10
104	10
105	03
105A	05
106	01
107	08
108	08
109	08
110	08
111	08
112	08
113	08
114	08
115	08
116	08
117	01
118	09
119	07
121	02
A101	04
A102	01
A102A	03

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Glass for windows doors interior borrowed lites storefront framing .
2. Glazing sealants and accessories.
3. Fire-protected-rating glazing.

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by manufacturer, in which manufacturer agrees to furnish replacements for units that deteriorate from normal use by developing defects attributable to the manufacturing process, within warranty period.

1. Laminated Glass:

a. Form of Deterioration: Edge separation or delamination that materially obstructs vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
b. Warranty Period: Five years from date of Substantial Completion.

2. Insulating Glass:

a. Form of Deterioration: Failure of hermetic seal resulting in obstruction of vision by dust, moisture, or film on interior surfaces of glass.
b. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.

1. Design Wind Pressures: As indicated on Drawings.
2. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

B. Safety Glazing: Permanently mark glazing with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, glass thickness, and safety glazing standard with which glass complies.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

D. Structural Performance: Provide security glazing products capable of resisting the kinds of lateral design loads indicated as demonstrated by testing according to FEMA 361.

1. Specified Design Wind Loads: As specified in Part 2 articles.

2.2 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.3 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.

C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

E. Reflective-Coated Vision Glass: ASTM C 1376.

F. Ceramic-Coated Spandrel Glass: ASTM C 1048, Type I, Condition B, Quality-Q3.

G. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

H. Ultraclear Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear), with visible light transmission not less than 91 percent.

2.4 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.

1. Sealing System: Dual seals.
2. Spacer: Manufacturer's standard spacer material and construction.

2.6 FIRE- PROTECTION-RATED GLAZING

A. Fire-Protection-Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing according to NFPA 257 or UL 9, including the hose-stream test, and shall comply with NFPA 80.

1. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from the hose-stream test.

B. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose-stream test; whether or not glazing meets 450 deg F temperature-rise limitation; and the fire-resistance rating in minutes.

C. Laminated Ceramic Glazing: Laminated glass made from two plies of clear, ceramic glass; 8-mm total thickness; and complying with 16 CFR 1201, Category II.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Interedge Technologies; Pyran Platinum L.
b. Safti First; Pyran Platinum L
c. Schott North America, Inc.; Pyran Platinum L.
d. Technical Glass Products; FireLite Plus.
e. Vetrotech Saint-Gobain; SGG Keralite FR-L.

2.7 POLYCARBONATE GLAZING PRODUCTS

A. Polycarbonate Sheet: ASTM C 1349, Appendix X1, type as specified in other Part 2 articles.

B. Interlayer for Laminated-Polycarbonate Units: Clear polyurethane interlayer with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating polycarbonate sheets and installation.

C. Fabrication: Laminate polycarbonate sheets to interlayer to produce laminated units free of foreign substances, air, and glass pockets.

2.8 SPALL-RESISTANT GLAZING FILM

A. Spall-Resistant Film: Composite of clear polyvinyl butyral film and clear abrasion-resistant polyester film.

1. Product: Subject to compliance with requirements, provide Spallshield by DuPont Glass Laminating Products or equivalent.

B. Laminating Process: Laminate spall-resistant film to glazing assemblies in factory to produce laminated lites free of foreign substances, air, and glass pockets.

2.9 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Field-applied sealants shall have a VOC content of not more than 250 g/L.
4. Sealants shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Use NT.

2.10 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Use methods approved by testing agencies that listed and labeled fire-resistant glazing products.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.3 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

3.4 MONOLITHIC GLASS SCHEDULE

A. Glass Type 4: Clear fully **tempered** float glass.

1. Minimum Thickness: 6 mm.
2. Safety glazing required.

B. Glass Type 3: Clear **annealed** float glass.

1. Minimum Thickness: 6 mm.

3.5 INSULATING GLASS SCHEDULE

A. Glass Type 1 - **Annealed**: Low-E-coated, tinted insulating glass. (Basis of design: Solarban 60 (2) Solargray + Clear by PPG)

1. Overall Unit Thickness: 1 inch.
2. Minimum Thickness of Each Glass Lite: 6 mm.
3. Outdoor Lite: Tinted annealed float glass.
4. Tint Color: Gray.
5. Interspace Content: Air.
6. Indoor Lite: Clear annealed float glass.
7. Low-E Coating: Sputtered on third surface.
8. Winter Nighttime U-Factor: 0.29.
9. Summer Daytime U-Factor: 0.27.
10. Visible Light Transmittance: 35 percent.
11. Solar Heat Gain Coefficient: 0.29

B. Glass Type 2 - **Tempered**: Low-E-coated, tinted insulating glass. (Basis of design: Solarban 60 (2) Solargray + Clear by PPG)

1. Overall Unit Thickness: 1 inch.
2. Minimum Thickness of Each Glass Lite: 6 mm.
3. Outdoor Lite: Tinted fully tempered float glass.
4. Tint Color: Gray.
5. Interspace Content: Air.
6. Indoor Lite: Clear fully tempered float glass.
7. Low-E Coating: Sputtered on third surface.
8. Winter Nighttime U-Factor: 0.29.
9. Summer Daytime U-Factor: 0.27.
10. Visible Light Transmittance: 35 percent.
11. Solar Heat Gain Coefficient: 0.29
12.
13.
14.
15. Safety glazing required.

3.6 FIRE-RESISTANT GLAZING SCHEDULE

A. Glass Type 5: 20-minute fire-protection-rated tempered glass.

B. Glass Type 6: 90-minute fire-protection-rated glazing tempered glass.

1. Basis of Design: Contraflam 90 Climaplus.

3.7 SECURITY-GLASS UNITS (Type 7)

A. aS INDICATED IN sEECTION 088853 - SECURITY GLAZING.

END OF SECTION 088000

SECTION 088300 - MIRRORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following types of silvered flat glass mirrors:

1. Tempered glass mirrors qualifying as safety glazing.

B. Related Requirements:

1. Section 088000 "Glazing" for glass with reflective coatings used for vision and spandrel lites.
2. Section 102800 "Toilet, Bath, and Laundry Accessories" for metal-framed mirrors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.

B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing.

1. Testing is not required if data are submitted based on previous testing of mirror mastic products and mirror backing matching those submitted.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILVERED FLAT GLASS MIRRORS

A. Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.

B. Tempered Glass Mirrors: Mirror Glazing Quality for blemish requirements and complying with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied; clear.

1. Nominal Thickness: 6.0 mm.
2. Tint Color: [Blue] [Black] [Bronze] [Gold] [Gray] [Green] [Peach] [Pink] <Insert color>.

C. Safety Glazing Products: For tempered mirrors, provide products that comply with 16 CFR 1201, Category II.

2.2 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

    a. Franklin International.
    b. Laurence, C. R. Co., Inc.
    c. Liquid Nails Adhesive.
    d. Macco Adhesives.
    e. Pecora Corporation.
    f. Sommer & Maca Industries, Inc.

D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.3 MIRROR HARDWARE

A. Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.

1. Bottom and Side Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch in height, respectively, and a thickness of not less than 0.04 inch.
2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch in height, respectively, and a thickness of not less than 0.04 inch.

    a. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

        1) Andscot Company, Inc.
        2) Laurence, C. R. Co., Inc.
        3) Stylmark, Inc.

3. Finish: Clear bright anodized.

B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.4 FABRICATION

A. Fabricate mirrors in the shop to greatest extent possible.

B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.

C. Mirror Edge Treatment: Rounded polished .

1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint, as recommended in writing by film-backing manufacturer, to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.

B. Verify compatibility with and suitability of substrates, including compatibility of existing finishes or primers with mirror mastic.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.3 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

1. GANA Publications: "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

B. Provide a minimum airspace of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.

1. Aluminum J-Channels: Provide setting blocks 1/8 inch thick by 4 inches long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch wide by 3/8 inch long at bottom channel.
2. Install mastic as follows:

a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch between back of mirrors and mounting surface.

3.4 CLEANING AND PROTECTION

A. Protect mirrors from breakage and contaminating substances resulting from construction operations.

B. Do not permit edges of mirrors to be exposed to standing water.

C. Maintain environmental conditions that prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

D. Clean exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 088300

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.

B. Related Requirements:

1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; and roof rafters and ceiling joists.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for steel unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G60, Hot-dip galvanized unless otherwise indicated.

B. Studs and Tracks: ASTM C 645.

1. Steel Studs and Tracks:

   a. Minimum Base-Steel Thickness: 0.0329 inch.
   b. Depth: As indicated on Drawings.

2. Embossed, High Strength Steel Studs and Tracks: Roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally comparable to conventional ASTM C 645 steel studs and tracks.

   a. Minimum Base-Steel Thickness: 0.0190 inch.
   b. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide the following:

1. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
2. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

D. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.

B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: unless otherwise indicated.
2. Multilayer Application: unless otherwise indicated.
3. Tile Backing Panels: unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.

    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

    a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
6. Curved Partitions:

    a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
    b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Hangers: 48 inches o.c.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

    a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

    a. Size supplemental suspension members and hangers to support ceiling loads within [performance limits established by referenced installation standards] <Insert deflection limit>.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

4. Do not attach hangers to steel roof deck.
5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.

B. Related Requirements:

1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
2. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :

a. CertainTeed Corporation.
b. Georgia-Pacific Building Products.

c. National Gypsum Company.
d. USG Corporation.

2. Thickness: 5/8 inch.
3. Long Edges: Tapered.

B. Abuse-Resistant Gypsum Board: ASTM C 1396/C 1396M gypsum board, tested according to ASTM C 1629/C 1629M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed Corporation.
b. Georgia-Pacific Building Products.
c. National Gypsum Company.
d. USG Corporation.

2. Core: 5/8 inch, Type X.
3. Surface Abrasion: ASTM C 1629/C 1629M, meets or exceeds Level 3 requirements.
4. Indentation: ASTM C 1629/C 1629M, meets or exceeds Level 1 requirements.
5. Soft-Body Impact: ASTM C 1629/C 1629M, meets or exceeds Level 2 requirements.
6. Long Edges: Tapered.
7. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. CertainTeed Corporation.
    b. Georgia-Pacific Building Products.
    c. National Gypsum Company.
    d. USG Corporation.

2. Core: 5/8 inch, Type X.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:

    a. Cornerbead.
    b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    c. L-Bead: L-shaped; exposed long flange receives joint compound.
    d. Expansion (control) joint.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints[, rounded or beveled panel edges,] and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

    a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: Vertical surfaces unless otherwise indicated.
2. Abuse-Resistant Type: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

2. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.4 APPLYING TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inch gap where panels abut other construction or penetrations.

B. Water-Resistant Backing Board: Install where indicated with 1/4 inch gap where panels abut other construction penetrations.

C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints [at locations indicated on Drawings] [according to ASTM C 840 and in specific locations approved by Architect for visual effect].

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

E. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.7 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Glazed ceramic wall tile.
2. Tile backing panels.
3. Metal edge strips.

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

C. Module Size: Actual tile size plus joint width indicated.

D. Face Size: Actual tile size, excluding spacer lugs.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Tile: Obtain tile from single source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:

1. Cementitious backer units.
2. Metal edge strips.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.3 TILE PRODUCTS

A. Ceramic Tile Type: Glazed wall tile. (finish schedule: CT)

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

   a. Design Positive (Virginia Tile) - Basis-of-Design
   b. Alternate tile products must be submitted prior to bidding.

2. Module Size: 8 by 20 inches.

3. Thickness: 5/16 inch.

4. Tile Color and Pattern: .

   a. Color 1: Blanc Satin.
   b. Color 2: Rouge Rouge 03.
   c. Pattern: Install Gris Galet color at plumbing fixture wall. Install Blanc Satin at all other walls scheduled for tile in Toilet rooms.

5. Grout Color: Mist 939 (TEC Powergrout).

2.4 TILE BACKING PANELS

A. Fiber-Cement Backer Board: ASTM C 1288, in maximum lengths available to minimize end-to-end butt joints.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. CertainTeed Corporation.
   b. James Hardie Building Products, Inc.

2. Thickness: 1/2 inch.

2.5 SETTING MATERIALS

A. Medium-Bed, Modified Dry-Set Mortar: Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of 5/8 inch.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. MAPEI Corporation - LFT or Ultralite Mortar.
   b. TEC / H.B. Fuller Construction Products Inc. - 3N1 Performance Mortar (Basis-of-Design)

2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.

2.6 GROUT MATERIALS

A. High-Performance Tile Grout: ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. MAPEI Corporation - Flexcolor CQ.
b. TEC / H.B. Fuller Construction Products Inc. - PowerGrout (Basis-of-Design).

2.7 MISCELLANEOUS MATERIALS

A. Metal Edge Strips: Angle or L-shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Blanke Corporation.
b. Ceramic Tool Company, Inc.
c. Schluter Systems L.P. (Basis-of-Design)

2. Metal Edge Strip Locations and Descriptions:

a. Install at all open corners at restroom walls:

1) Schluter QUADEC / K
2) material: anodized aluminum

B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
2. Verify that concrete substrates for tile floors installed with [adhesives] [bonded mortar bed] [or] [thinset mortar] comply with surface finish requirements in ANSI A108.01 for installations indicated.

    a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

1. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
2. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Glazed Wall Tile: 1/16 inch.
2. Porcelain Wall Tile: 1/8 inch.

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

J. Metal Edge Strips: Install at all open corners at restroom walls.

3.4 TILE BACKING PANEL INSTALLATION

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.[Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.]

3.5 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.

2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.6 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.7 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Wall Installations, Masonry or Concrete:

1. Ceramic Tile Installation : TCNA W202; thinset mortar.

   a. Ceramic Tile Type: CT.
   b. Thinset Mortar: Medium-bed, latex- portland cement mortar.
   c. Grout: high performance grout.

B. Interior Wall Installations, Wood or Metal Studs or Furring:

1. Ceramic Tile Installation : TCNA W244C or TCNA W244F; thinset mortar on cementitious backer units or fiber-cement backer board.

   a. Ceramic Tile Type: CT.
   b. Thinset Mortar: Medium-bed, Latex- portland cement mortar.
   c. Grout: high performance grout.

END OF SECTION 093013

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.
2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E 1264.
2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANELS (Ceiling Type A & B)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong School Zone or comparable product by one of the following:

1. Armstrong World Industries, Inc - School Zone.
2. United States Gypsum Company - Radar High NRC/CAC.
3. Rockfon - Artic.

B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Classification: Provide panels as follows:

1. Type and Form: Type III, mineral base with painted finish; Form 2, pattern C E.

D. Color: White.

E. Light Reflectance (LR): Not less than 0.85.

F. Ceiling Attenuation Class (CAC): Not less than 35.

G. Noise Reduction Coefficient (NRC): Not less than 0.70.

H. Edge/Joint Detail: Square.

I. Thickness: 5/8 inch .

J. Modular Size:

1. Ceiling Type A: 24 by 48 inches .
2. Ceiling Type B: 24 by 24 inches.

2.4 ACOUSTICAL PANELS (Ceiling Type C)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Kitchen Zone or comparable product by one of the following:

1. Armstrong World Industries, Inc - Kitchen Zone.
2. United States Gypsum Company - Sheetrock Lay-in Panel.
3. Rockfon - Hygienic Plus.

B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Classification: Provide panels as follows:

1. Type and Form: Type IX, mineral base with painted finish; Form 2, water felted, pattern G.

D. Color: White.

E. Light Reflectance (LR): Not less than 0.85.

F. Ceiling Attenuation Class (CAC): Not less than 30.

G. Edge/Joint Detail: Square.

H. Thickness: 5/8 inch .

I. Modular Size:

1. Ceiling Type C: 24 by 48 inches .

2.5 METAL SUSPENSION SYSTEM (Ceiling Type A & B)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Prelude XL or comparable product by one of the following:

1. Armstrong World Industries, Inc - Prelude XL.
2. United States Gypsum Company - DX/DXL.
3. Chicago Metallic Corporation - 1200.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Cold-rolled steel.
5. Cap Finish: Painted white.

2.6 METAL SUSPENSION SYSTEM (Ceiling Type C)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Prelude Plus XL Aluminum or comparable product by one of the following:

1. Armstrong World Industries, Inc - Prelude Plus XL Aluminum.
2. United States Gypsum Company - DXLA.
3. Chicago Metallic Corporation - 1280.

B. Wide-Face, Aluminum-Capped, Double-Web, Hot-Dip Galvanized, G60 , Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized, G60 coating designation; with prefinished, 15/16-inch- wide aluminum caps on flanges.

1. Structural Classification: Heavy-duty system.
2. Face Design: Flat, flush.
3. Cap Finish: Painted white.

2.7 ACCESSORIES

A. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.135-inch- diameter wire.

B. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

2.8 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. United States Gypsum Company.
3. Insert manufacturer's name.

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.

3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

C. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.

1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils . Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.9 CEILING TRANSITIONS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc - Axiom Transitions (basis-of-design).
2. United States Gypsum Company - Compasso Elite Transitions.
3. Chicago Metallic.

a. Basis-of-Design Products from Armstrong:

1) Straight Axiom Transitions: AXTR6STR.
2) Outside Corner Axiom Transition: AXTR6QSOS.

B. Material: Steel.

C. Locations: As indicated on RCP drawings. Provide at ceiling drop at classroom entrances.

D. Transition Piece Colors: Custom Colors. A different color will be used at each classroom wing.

1. Area A & B (yellow): match SW 6683 Bee.
2. Area C (Navy): match SW 9143 Moscow Midnight.
3. Area D (Green): match SW 6473 Surf Green.
4. Area E (Orange): match SW 6635 Determined Orange.

E. Height: 6 inches, unless indicated otherwise on drawings.

F. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.

10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.

2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

1. Arrange directionally patterned acoustical panels as follows:

a. As indicated on reflected ceiling plans.
b. Install panels in a basket-weave pattern.

2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.

3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Resilient base.
2. Resilient molding accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For resilient base and accessory products.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE (Finish Schedule: RB)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
2. Flexco.
3. Roppe Corporation, USA. (Basis-of-Design)

B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).

1. Style and Location:

a. Style B, Cove: Throughout project.

C. Thickness: 0.125 inch.

D. Height: 4 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Job formed or preformed.

G. Inside Corners: Job formed or preformed.

H. Colors: Black 100.

2.2 RUBBER MOLDING ACCESSORY

A. Manufacturers: Subject to compliance with requirements, provide products by the following: Refer to List below for Manufacturer / Product & location.

1. Roppe Corporation, USA.

B. Description: Resilient nosing for carpet nosing for resilient flooring reducer strip for resilient flooring joiner for tile and carpet.

C. Transitions: Profiles:

1. Carpet Tile(CPT/WOM) to VCT
2. Resinous (RES) to VCT

a. Provide transition by one of the following:

1) Tandus Metal Edge Deux (steel color).
2) Armstrong: Luxury Flooring Transition Strip VTL61 (graphic gray).

3. VCT to Concrete - Roppe #168 (black 100).

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches in length.

    a. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches in length.

    a. Miter corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Rubber floor tile.
2. Vinyl composition floor tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE (finish schedule: VCT)

A. Products: Subject to compliance with requirements, provide the following:

1. Armstrong World Industries, Inc; Standard Excelon.
2. Alternate VCT products must be submitted before bidding.

B. Tile Standard: ASTM F 1066, Class 2, through pattern.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 12 by 12 inches.

F. Colors and Patterns: As indicated on drawings.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft. , and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

    a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

E. Do not install floor tiles until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis, in pattern indicatedon drawings.

2. Quarter-turn tiles (basketweave).

C. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

D. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

F. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

G. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

H. Seamless Installation:

1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.

1. Apply three coat(s).

E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.

F. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes resinous flooring systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Initial Selection: For each type of exposed finish required.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 PERORMANCE REQUIREMENTS

A. Flammability: Self-extinguishing according to ASTM D 635.

2.2 MANUFACTURERS

A. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

2.3 RESINOUS FLOORING (Finish Schedule: RES)

A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.

1. Installers: Subject to compliance with requirements, provide products as installed by one of the following: Refer to products listed in specification for specific manufacturers & product systems:

a. Desco Coatings.
b. Epoxy Coating Specialists.
c. Treadwell.
d. Technicote Inc.

B. System Characteristics:

1. Color and Pattern: Custom color Blends for each color indicated on finish floor plan.
2. Wearing Surface: As selected by Architect.
3. Overall System Thickness: 1/16 inch.

C. Primer: Moisture Vapor Reducer: type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.

1. Moisture Vapor Reducer: Product, as recommended by manufacturer, that has the ability to bond to concrete with a relative humidity (RH) as high at 99% at 40% depth and designed to reduce moisture vapor emission levels up to 20 lbs/1000 sq ft.
2. Manufacturers: Subject to compliance with requirements, provide product by one of the following:

a. Tennant MVS Epoxy..
b. Desco: Hydrabond.
c. Tnemec: Series 208.
d. Dur-a-Flec: Dur-a-Glaze MVP.

3. Formulation Description: 100 percent solids.

D. Reinforcing Membrane: Flexible resin formulation that is recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated and that inhibits substrate cracks from reflecting through resinous flooring.

1. Formulation Description: 100 percent solids.
2. Apply at cracks 1/16 inch or larger.

E. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

F. Body Coats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Tennant: Eco-DFS..
    b. Desco: Granite Series.
    c. Tnemec: Deco Flake Series 224.
    d. Dur-a-Flex: Dur-a-Chip.

2. Resin: Epoxy .
3. Formulation Description: 100 percent solids.
4. Type: Clear.
5. Application Method: Self-leveling slurry with broadcast aggregates .
6. Number of Coats: Two.
7. Aggregates: Vinyl flakes.

G. Grout Coat:

1. : Subject to compliance with requirements, provide products by one of the following:

    a. Tennant: Eco-URE..
    b. Desco: Grout.
    c. Tnemec: Deco Fleck Series 224.
    d. Dura-a-Flex: Glaze 4.

2. Resin: Epoxy .
3. Formulation Description: 100 percent solids.
4. Type: Clear.
5. Thickness of Coat: 8 mils - 12 mils.

H. Topcoats: Sealing or finish coats.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Tennant: Eco-HTS..
    b. Desco: WBU Satin.
    c. Tnemec: Series 248.
    d. Dura-Flex: Armor Top.

2. Resin: Urethane .
3. Formulation Description: 100 percent solids.
4. Type: Clear.
5. Number of Coats: One.
6. Finish: As selected by Architect.

I. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Compressive Strength: 10,000 psi minimum according to ASTM C 579.
2. Tensile Strength: 2,250 psi minimum according to ASTM C 307.
3. Flexural Modulus of Elasticity: 4,000 psi minimum according to ASTM C 580.
4. Impact Resistance: No chipping, cracking, or delamination and not more than 1/16-inch permanent indentation according to MIL-D-3134J.
5. Abrasion Resistance: 0.08 mg loss maximum weight loss according to ASTM D 4060.
6. Hardness: 85-90, Shore D according to ASTM D 2240.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Roughen concrete substrates as follows:

   a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
   b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

   a. Relative Humidity Test: Use in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

3.2 APPLICATION

A. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Reinforcing Membrane: Apply reinforcing membrane to substrate cracks.

D. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

1. Integral Cove Base: 4 inches high.

E. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.

1. Aggregates: Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.

F. Grout Coat: Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat.

G. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.3 PROTECTION

A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes modular carpet tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Include manufacturer's written installation recommendations for each type of substrate.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI's "CRI Carpet Installation Standard."

1.6 FIELD CONDITIONS

A. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.7 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, the following:

a. More than 10 percent edge raveling, snags, and runs.
b. Dimensional instability.
c. Excess static discharge.
d. Loss of tuft-bind strength.
e. Loss of face fiber.
f. Delamination.

3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 **CARPET TILE (finish Schedule: CPT 1)**

A. s: Subject to compliance with requirements, provide one of the following:

1. Interface, LLC - AE311, 25cm x 1m plank tile (color: Iron) .
2. Mohawk Group (The); Mohawk Carpet, LLC - Shared Path, 12" x 36" plank tile (color: Slate).
3. Patcraft; a division of Shaw Industries, Inc - Nocturne, 9" x 36" plank tile (color: Lumen).

B. Color: Color will be confirmed on contractor submittal, do not order prior to Architect's confirmation.

C. Fiber Content: 100 percent nylon 6.

D. Primary Backing/Backcoating: manufacturer's standard.

E. Size: Plank Tile, size indicated above.

F. Install: Ashlar.

2.2 **CARPET TILE (finish Schedule: CPT 2 & CPT3 & CPT4)** Media Center Carpet Tile

A. Basis-of-Design Product: Subject to compliance with requirements, provide the following:

1. Interface, LLC - Urban Retreat Collection.
2. Alternate products to be submitted prior to bidding.

B. Patterns & Colors:

1. CPT 2: UR102 (Color: Ash).
2. CPT 3: UR101 Color: Ash/Ivy).

3. CPT 4: UR103 (Color: Ivy).

C. Fiber Content: 100 percent nylon 6.

D. Primary Backing/Backcoating: Manufacturer's Standard.

E. Size: 50 cm x 50cm .

F. Install: Refer to drawings for layout in Media Center.

1. UR102 & UR103 nondirectional install
2. UR101:monothilic install. Install so that green side of tile matches green adjacent carpet (CPT 4), and beige side of tile matches up with beige carpet (CPT 1).

2.3 **WALK-OFF MAT CARPET TILE (finish schedule: WOM)**

A. Manufacturers: Subject to compliance with requirements, provide product by the following:

1. Patcraft; a division of Shaw Industries, Inc - Foot in the Door II.
2. Mohawk Contract - First Step.
3. J&J Invision - Alter Ego.

B. Pattern & Color: As selected by Architect from Manufacturer's standards.

C. Carpet-Type Tiles: Nylon, Polypropylene, Olefin, or Polyester carpet bonded to 1/8- to 1/4-inch-(3.2- to 6.4-mm-) thick, flexible vinyl backing to form carpet tiles 3/8 or 7/16 inch (9.5 or 11 mm) thick with nonraveling edges.

D. Size: manufacturer's standard square size.

E. Install: Quarter-turn.

2.4 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

1. Adhesives shall have a VOC content of 50 g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
b. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

D. Wood Subfloors: Verify the following:

1. Underlayment over subfloor complies with requirements specified in Section 061600 "Sheathing."
2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.

E. Painted Subfloors: Perform bond test recommended in writing by adhesive manufacturer.

1. Access Flooring Systems: Verify the following:
2. Access floor substrate is compatible with carpet tile and adhesive if any.
3. Underlayment surface is flat, smooth, evenly planed, tightly jointed, and free of irregularities, gaps greater than 1/8 inch , protrusions more than 1/32 inch , and substances that may interfere with adhesive bond or show through surface.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI's "Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.

B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.

C. Installation Pattern: as indicated in Products section of specification.

D. Maintain dye-lot integrity. Do not mix dye lots in same area.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with CRI's "Carpet Installation Standard," Section 20, "Protecting Indoor Installations."

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Steel and iron.
2. Galvanized metal.

1.3 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide the following:

1. Sherwin-Williams Company (The).

C. Products: Subject to compliance with requirements, provide product listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:
1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.
1. 100 percent of surface area will be painted with deep tones.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:

   1. SSPC-SP 2.
   2. SSPC-SP 3.
   3. SSPC-SP 7/NACE No. 4.
   4. SSPC-SP 11.

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.

4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates:

1. Alkyd System :

a. Prime Coat: Primer, metal, surface tolerant.

1) Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.

b. Intermediate Coat: Exterior, waterbased, matching topcoat.
c. Topcoat: Waterbased, exterior, semi-gloss (MPI Gloss Level 5).

1) Sherwin Williams: Pro Industrial Acrylic Semi-Gloss.

B. Galvanized-Metal Substrates:

1. Water-Based Light Industrial Coating System MPI EXT 5.3G:

a. Prime Coat: Primer, galvanized, water based.

1) Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.

b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.

c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5).

1) Sherwin Williams: Pro Industrial Acrylic Semi-Gloss.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Concrete masonry units (CMUs).
3. Steel and iron.
4. Galvanized metal.
5. Gypsum board.

1.3 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square (minimum).
2. Apply coats on Samples in steps to show each coat required for system.
3. Label each coat of each Sample.

C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following: Alternate products must be approved by Architect prior to bidding.

1. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide product listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Shellacs, Clear: 730 g/L.
9. Shellacs, Pigmented: 550 g/L.

C. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Colors: As indicated on drawings.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMUs): 12 percent.
3. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 2.
2. SSPC-SP 3.
3. SSPC-SP 7/NACE No. 4.
4. SSPC-SP 11.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Tanks that do not have factory-applied final finishes.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

2. Paint the following work where exposed in occupied spaces:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.

f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
g. Other items as directed by Architect.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Traffic Surfaces:

1. Water-Based Concrete Floor Sealer System :

    a. First Coat: Sealer, water based, for concrete floors, matching topcoat.
    b. Topcoat: Sealer, water based, for concrete floors.

        1) H&C: Wet Look Sealer.

B. CMU Substrates:

1. High-Performance Architectural Latex System :

    a. Block Filler: Block filler, latex, interior/exterior.

        1) Sherwin Williams: PrepRite Blockfiller.

    b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.

    c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 5).

        1) Sherwin Williams: Pro Industrial Pre-Catalyzed Waterbased Epoxy (semi-gloss).

C. Steel Substrates:

1. Water-Based Light Industrial Coating System :

    a. Prime Coat: Primer, rust-inhibitive, water based.

        1) Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.

    b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

    c. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5).

        1) Sherwin Williams: Pro Industrial Pre-Catalyzed Waterbased Epoxy (Semi-Gloss).

D. Galvanized-Metal Substrates:

1. Water-Based Light Industrial Coating System :

    a. Prime Coat: Primer, galvanized, water based.

        1) Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.

    b. Intermediate Coat: Light industrial coating, interior, water based, matching topco at.

    c. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5).

        1) Sherwin Williams: Pro Industrial Pre-Catalyzed Waterbased Epoxy (Semi-Gloss).

E. Gypsum Board and Substrates:

1. High-Performance Architectural Latex System :

a. Prime Coat: Primer sealer, latex, interior.

1) Sherwin Williams: ProMar 200 Zero VOC Latex Primer.

b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.

c. Topcoat (Walls): Latex, interior, high performance architectural (MPI Gloss Level 5).

1) Sherwin Williams: Pro Industrial Acrylic Coating (semi-gloss).

d. Topcoat (Ceilings & Soffits): Latex, interior, high performance architectural (MPI Gloss Level 1).

1) Sherwin Williams: ProMar 200 Zero VOC Interior Latex Flat.

END OF SECTION 099123

SECTION 101100 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Visual display board assemblies.

a. Markerboards
b. Tackboards

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.

B. Shop Drawings: For visual display units.

1. Include plans, elevations, sections, details, and attachment to other work.
2. Show locations of panel joints. Show locations of field-assembled joints for factory-fabricated units too large to ship in one piece.
3. Include sections of typical trim members.

C. Samples for Initial Selection: For each type of visual display unit indicated, for units with factory-applied color finishes, and as follows:

1. Fabric swatches of fabric facings for tackboards.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify actual dimensions of construction contiguous with visual display units by field measurements before fabrication.

1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

1.6 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Surfaces lose original writing and erasing qualities.
b. Surfaces exhibit crazing, cracking, or flaking.

2. Warranty Period: 50 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of visual display unit from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

2.3 VISUAL DISPLAY BOARD ASSEMBLY

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

1. AARCO Products, Inc.
2. Best-Rite Manufacturing; a brand division of MooreCo, Inc.
3. Claridge Products and Equipment, Inc.
4. Marsh Industries, Inc.; Visual Products Group.
5. Platinum Visual Systems; a division of ABC School Equipment, Inc.

B. Visual Display Board Assembly: factory fabricated.

1. Assembly: markerboard and tackboard.
2. Corners: Square.
3. Width: As indicated on Drawings.
4. Height: 48 inches unless noted otherwise.

5. Mounting Method: Direct to wall.

C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.

1. Color: White.

D. Tackboard Panel: Vinyl-fabric-faced tackboard panel on core indicated.

1. Color and Pattern: As selected by Architect from full range of industry colors.

E. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- thick, extruded aluminum; standard size and shape .

1. Aluminum Finish: Clear anodic finish.

F. Combination Assemblies: Provide H-trim between abutting sections of visual display panels.

G. Chalktray: Manufacturer's standard; continuous.

1. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.

H. Display Rail: Manufacturer's standard, extruded-aluminum display rail with plastic-impregnated-cork insert, end stops, designed to hold accessories.

1. Size: 2 inches high by full length of visual display unit.
2. Map Hooks: Two map hooks for every 48 inches of display rail or fraction thereof.
3. Map Hooks and Clips: Two map hooks with flexible metal clips for every 48 inches of display rail or fraction thereof.
4. Flag Holder: One for each room.
5. Tackboard Insert Color: As selected by Architect from full range of industry colors.
6. Aluminum Color: Match finish of visual display assembly trim.

2.4 MARKERBOARD PANELS

A. Porcelain-Enamel Markerboard Panels: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction, consisting of moisture-barrier backing, core material, and porcelain-enamel face sheet with low-gloss finish. Laminate panels under heat and pressure with manufacturer's standard, flexible waterproof adhesive.

1. Face Sheet Thickness: 0.013 inch uncoated base metal thickness.
2. Particleboard Core: 1/2 inch thick; with 0.013-inch- thick, galvanized-steel sheet backing.
3. Laminating Adhesive: Manufacturer's standard moisture-resistant thermoplastic type.

2.5 TACKBOARD PANELS

A. Tackboard Panels:

1. Facing: Vinyl fabric factory laminated to 1/4-inch- thick cork sheet.

2. Core: 1/4-inch- thick particleboard.

2.6 MATERIALS

A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.

B. Natural-Cork Sheet: Seamless, single-layer, compressed fine-grain cork sheet; bulletin board quality; face sanded for natural finish.

C. Vinyl Fabric: Mildew resistant, washable, complying with FS CCC-W-408D, Type II, ; weighing not less than 13 oz./sq. yd.; with surface-burning characteristics indicated.

D. Particleboard: ANSI A208.1, Grade M-1, made with binder containing no urea formaldehyde.

E. Extruded Aluminum: ASTM B 221, Alloy 6063.

F. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.

2.7 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motorized, sliding visual display units.

C. Examine walls and partitions for proper preparation and backing for visual display units.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.

C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.

D. Prime wall surfaces indicated to receive visual display units and as recommended in writing by primer/sealer manufacturer and visual display unit manufacturer.

3.3 INSTALLATION

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

B. Factory-Fabricated Visual Display Board Assemblies: Adhere to wall surfaces with egg-size adhesive gobs at 16 inches o.c., horizontally and vertically.

C. Visual Display Board Assembly Mounting Heights: Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated below.

1. Mounting Height for Grades pre-K through 3: 24 inches above finished floor to top of chalktray.
2. Mounting Height for Grades 4 through 6: 28 inches above finished floor to top of chalktray.
3. Mounting Height for Grades 7 and Higher: 36 inches above finished floor to top of chalktray.

3.4 CLEANING AND PROTECTION

A. Clean visual display units according to manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display units after installation and cleaning.

END OF SECTION 101100

SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cast dimensional characters.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, and layout for each sign at least quarter scale.

1.4 FIELD CONDITIONS

A. Field Measurements: Verify locations of electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DIMENSIONAL CHARACTERS

A. Cast Characters: Characters with uniform faces, sharp corners, and precisely formed lines and profiles, and as follows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Gemini Incorporated - Metal Letters Cast.

2. Character Material: Cast aluminum.
3. Character Height: As indicated on Drawings.
4. Thickness: Manufacturer's standard for size of character.
5. Finishes:

a. Integral Aluminum Finish: Clear anodized.

6. Mounting: Concealed studs.

7. Typeface: Helvetica.

2.2 DIMENSIONAL CHARACTER MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.

B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.3 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. For exterior exposure, furnish nonferrous-metal stainless-steel or hot-dip galvanized devices unless otherwise indicated.
3. Exposed Metal-Fastener Components, General:

    a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.

    b. Fastener Heads: For nonstructural connections, use flathead or oval countersunk screws and bolts with tamper-resistant Allen-head spanner-head or one-way-head slots unless otherwise indicated.

4. Sign Mounting Fasteners:

    a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

2.4 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
5. Internally brace dimensional characters for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
6. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
7. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.5 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.6 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, [Class I, 0.018 mm] [Class II, 0.010 mm] or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that electrical service is correctly sized and located to accommodate signs.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.

b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Back Bar and Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position, so that signage is correctly located and aligned.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101419

SECTION 101423.16 - ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Room-identification signs.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For room-identification signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign in a scaled drawing.

C. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Room-Identification Signs: Full-size Sample.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 ROOM-IDENTIFICATION SIGNS

A. Room-Identification Sign : Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. ACE Sign Systems, Inc.
    b. Advance Corporation.
    c. APCO Graphics, Inc.
    d. ASI Sign Systems, Inc.
    e. Best Sign Systems, Inc.
    f. InPro Corporation (IPC).
    g. Mohawk Sign Systems.
    h. Vista System.

2. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated to acrylic backing sheet to produce composite sheet.

    a. Composite-Sheet Thickness: 0.125 inch.

    b. Subsurface Graphics: Reverse etch imageand Slide-in changeable insert.
    c. Color(s): As selected by Architect from manufacturer's full range.

3. Sign-Panel Perimeter: Finish edges smooth.

    a. Edge Condition: Square cut.
    b. Corner Condition in Elevation: As indicated on Drawings.

4. Mounting: Surface mounted to wall with adhesive or two-face tape.

5. Text and Typeface: Accessible raised characters and Braille and typface indicated on drawings. Finish raised characters to contrast with background color, and finish Braille to match background color.

2.3 SIGN MATERIALS

A. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

B. Vinyl Film: UV-resistant vinyl film with pressure-sensitive, permanent adhesive; die cut to form characters or images as indicated on Drawings and suitable for exterior applications.

C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.

B. Adhesive: As recommended by sign manufacturer.

C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

2.5 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
4. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.

C. Subsurface-Etched Graphics: Reverse etch back face of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.

D. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:

1. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Accessibility: Install signs in locations on walls as indicated on Drawings.

C. Mounting Methods:

1. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.

2. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

3.2 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423.16

SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Solid-plastic toilet compartments configured as toilet enclosures entrance screens urinal screens.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.

B. Shop Drawings: For toilet compartments.

1. Include plans, elevations, sections, details, and attachment details.
2. Show locations of centerlines of toilet fixtures.
3. Show ceiling grid, ceiling-mounted items, and overhead support or bracing locations.

C. Samples for Initial Selection: For each type of toilet compartment material indicated.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 75 or less.
2. Smoke-Developed Index: 450 or less.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

2.2 SOLID-PLASTIC TOILET COMPARTMENTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Accurate Partitions Corporation.
2. Bradley Corporation; Mills Partitions.
3. General Partitions Mfg. Corp.
4. Knickerbocker Partition Corporation.
5. Metpar Corp.
6. Partition Systems Incorporated of South Carolina; Columbia Partitions.
7. Scranton Products.

B. Toilet-Enclosure Style: Overhead braced Floor anchored.

C. Entrance-Screen Style: Overhead braced Floor anchored.

D. Urinal-Screen Style: Wall hung.

E. Door, Panel, Screen, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.

1. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum or stainless-steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
2. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range.

F. Pilaster Shoes: Manufacturer's standard design; .

G. Brackets (Fittings):

1. Stirrup Type: Ear or U-brackets, clear-anodized aluminum.

2.3 HARDWARE AND ACCESSORIES

A. Hardware and Accessories: Manufacturer's heavy-duty operating hardware and accessories.

1. Hinges: Manufacturer's minimum 0.062-inch- thick stainless-steel continuous, cam type that swings to a closed or partially open position, allowing emergency access by lifting door. Mount with through-bolts.

2. Latch and Keeper: Manufacturer's heavy-duty surface-mounted cast-stainless-steel latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through-bolts.
3. Coat Hook: Manufacturer's heavy-duty combination cast-stainless-steel hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories. Mount with through-bolts.
4. Door Bumper: Manufacturer's heavy-duty rubber-tipped cast-stainless-steel bumper at out-swinging doors[and entrance-screen doors]. Mount with through-bolts.
5. Door Pull: Manufacturer's heavy-duty cast-stainless-steel pull at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through-bolts.

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M.

B. Aluminum Extrusions: ASTM B 221.

C. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

D. Stainless-Steel Castings: ASTM A 743/A 743M.

2.5 FABRICATION

A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

D. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at[tops and] bottoms of posts. Provide shoes[and sleeves (caps)] at posts to conceal anchorage.

E. Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide, in-swinging doors for standard toilet compartments and 36-inch- wide, out-swinging doors with a minimum 32-inch- wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.

1. Confirm location and adequacy of blocking and supports required for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:

a. Pilasters and Panels: 1/2 inch.
b. Panels and Walls: 1 inch.

2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.

a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
b. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

C. Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust so tops of doors are level with tops of pilasters when doors are in closed position.

D. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors[and doors in entrance screens] to return doors to fully closed position.

END OF SECTION 102113.19

SECTION 102123 - CUBICLE CURTAINS AND TRACK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cubicle curtains.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Cubicle Curtains: Provide curtain fabrics with the following characteristics:

1. Laundering: Launderable to a water temperature of not less than [160 deg F] <**Insert temperature**>.

2. Flame Resistance: Provide fabrics identical to those that have passed NFPA 701 when tested by a qualified testing agency acceptable to authorities having jurisdiction.

a. Identify fabrics with appropriate markings of a qualified testing agency.

2.2 CURTAINS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

1. A. R. Nelson Co.
2. Barjan Manufacturing Ltd.
3. Erwin and Associates, Inc.

C. Fabric: Curtain manufacturer's standard, 100 percent polyester; inherently and permanently flame resistant, stain resistant, and antimicrobial.

1. Proprietary Fiber:

a. Products: Subject to compliance with requirements, [**provide the following**] [**provide one of the following**] [**available products that may be incorporated into the Work include, but are not limited to, the following**]:

1) INVISTA; Avora FR.
2) Trevira; Trevira CS.

2. Pattern: .
3. Width: Insert dimension.
4. Color: As selected by Architect from manufacturer's full range.

D. Curtain Grommets: Two-piece, rolled-edge, rustproof, nickel-plated brass; spaced not more than 6 inches o.c.; machined into top hem.

E. Beaded-Chain Curtain Drop: 6 inches long; nickel-plated steel with aluminum hook.

F. PVC-Strip Curtain Drop: 16 inches long with chrome-plated steel hook.

G. Curtain Tieback: Nickel-plated brass chain; one at each curtain termination.

2.3 CURTAIN FABRICATION

A. Continuous Curtain Panels:

1. Width: Equal to track length from which curtain is hung plus 10 percent of added fullness, but not less than 12 inches of added fullness.
2. Length: Equal to floor-to-ceiling height, minus depth of track and carrier at top, and minus clearance above the finished floor of 15 inches .
3. Mesh Top: Top hem of mesh not less than 1 inch and not more than 1-1/2 inches wide, triple thickness, reinforced with integral web, and double lockstitched. Double lockstitch bottom of mesh directly to 1/2-inch triple thickness, top hem of curtain fabric.
4. Bottom Hem: Not less than 1 inch and not more than 1-1/2 inches wide, double thickness and double lockstitched.
5. Side Hems: Not less than 1/2 inch and not more than 1-1/4 inches wide, with triple turned edges, and single lockstitched.
6. Vertical Seams: Not less than 1/2 inch wide, double turned and double stitched.

B. Modular Curtain Panels:

1. Fabric Panels: wide. Fabricate panels in quantity required to provide assembled curtains equal to track lengths plus 10 percent added fullness, but not less than 12 inches added fullness.
    a. Top Hem: Not less than 1 inch and not more than 1-1/2 inches wide, triple thickness, reinforced with integral web, double lockstitched, and with snap attachments to attach panels to mesh top.
    b. Side Hems: Not less than 1/2 inch and not more than 1-1/4 inches wide, with double turned edges, single lockstitched, and with snap attachments to attach one panel to another.
2. Length: Equal to floor-to-ceiling height, minus depth of track and carrier at top, and minus clearance above the finished floor of .
3. Mesh Top: Top hem of mesh not less than 1 inch and not more than 1-1/2 inches wide, triple thickness, reinforced with integral web, and double lockstitched.
4. Vertical Seams: Not less than 1/2 inch wide, double turned and double stitched.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install tracks level and plumb, according to manufacturer's written instructions.

B. For tracks of up to 20 feet in length, provide track fabricated from single, continuous length.

1. Curtain-Track Mounting: [**Surface**] [**Suspended**] [**As indicated on Drawings**].

C. Surface-Track Mounting: Fasten tracks to ceilings at intervals recommended by manufacturer. Fasten tracks to structure at each splice and tangent point of each corner. Center fasteners in track to ensure unencumbered carrier operation. Attach track to ceiling as follows:

1. Mechanically fasten directly to bottom of concrete deck with post-installed anchors.
2. Mechanically fasten directly to finished ceiling with toggle bolts.
3. Mechanically fasten to furring through suspended ceiling with screw and tube spacer.
4. Mechanically fasten to suspended ceiling grid with screws.
5. Attach track to suspended ceiling grid with manufacturer's proprietary clip.

D. Suspended-Track Mounting: Install track with manufacturer's standard tubular aluminum suspended supports at intervals and with fasteners recommended by manufacturer. Fasten supports to structure. Provide supports at each splice and tangent point of each corner. Secure ends of track to wall with flanged fittings or brackets.

E. Track Accessories: Install splices, end caps, connectors, end stops, coupling and joining sleeves, and other accessories as required for a secure and operational installation.

1. Provide one locking switch unit for each pair of beds.
2. Provide one hinged loading unit for each [**bed**] [**pair of beds with locking switch unit**].

F. Curtain Carriers: Provide curtain carriers adequate for 6-inch spacing along full length of curtain plus an additional carrier.

G. Cubicle Curtains: Hang curtains on each curtain track.[**Secure with curtain tieback.**]

END OF SECTION 102123

SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Corner guards.
2. End-wall guards.
3. Abuse-resistant wall coverings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

2. Include fire ratings of units recessed in fire-rated walls and listings for door-protection items attached to fire-rated doors.

B. Shop Drawings: For each type of wall and door protection showing locations and extent.

1. Include plans, elevations, sections, and attachment details.[Show handrail design and support spacing required to withstand structural loads.]

C. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.

1. Include Samples of accent strips and accessories to verify color selection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Guard Covers & Corner Gaurds: Full-size units / panels of maximum length equal to 1 percent of each type, color, and texture of cover installed, but no fewer than two,- units.
2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
2. Keep plastic materials out of direct sunlight.
3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.

    a. Store corner-guard covers in a vertical position.
    b. Store covers in a horizontal position.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain wall- and door-protection products[of each type] from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities andICC A117.1.

2.3 CORNER GUARDS

A. Surface-Mounted, Metal Corner Guards : Fabricated as one piece from formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Floor Products Company, Inc.
    b. Balco, Inc.
    c. Construction Specialties, Inc.
    d. InPro Corporation (IPC).
    e. Korogard Wall Protection Systems; a division of RJF International Corporation.
    f. WallGuard.com.

2. Material: Stainless-steel sheet, Type 304.

    a. Thickness: Minimum 0.0500 inch.
    b. Finish: Directional satin, No. 4.

3. Wing Size: Nominal 1-1/2 by 1-1/2 inches.
4. Corner Radius: 1/8 inch.
5. Mounting: Adhesive.

2.4 END-WALL GUARDS

A. Surface-Mounted, Metal, End-Wall Guards : Fabricated from one-piece, formed or extruded metal that covers entire end of wall; with formed edges.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. American Floor Products Company, Inc.
    b. Balco, Inc.
    c. Construction Specialties, Inc.
    d. InPro Corporation (IPC).
    e. Korogaurd Wall Protection; a division of RJF International Corporation.
    f. WallGuard.com.

2. Material: Stainless-steel sheet, Type 304.

    a. Thickness: Minimum 0.0500 inch.
    b. Finish: Directional satin, No. 4.

3. Wing Size: Nominal 1-1/2 by 1-1/2 inches.
4. Corner Radius: 1/8 inch.
5. Mounting: Adhesive.

2.5 ABUSE-RESISTANT WALL COVERINGS

A. Abuse-Resistant Sheet Wall Covering : Fabricated from semirigid, plastic sheet wall-covering material.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Construction Specialties, Inc.
   b. InPro Corporation (IPC).
   c. Korogard Wall Protection Systems; a division of RJF International Corporation.

2. Size: 48 by 120 inches for roll.
3. Sheet Thickness: 0.040 inch.
4. Color and Texture: As selected by Architect from manufacturer's full range.
5. Height: Wainscot, refer to drawings.
6. Trim and Joint Moldings: Extruded aluminum that matches wall-covering color.
7. Mounting: Adhesive.

2.6 MATERIALS

A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required, thickness as indicated.

B. Polycarbonate Plastic Sheet: ASTM D 6098, S-PC01, Class 1 or Class 2, abrasion resistant; with a minimum impact-resistance rating of 15 ft.-lbf/in. of notch when tested according to ASTM D 256, Test Method A.

C. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

D. Adhesive: As recommended by protection product manufacturer.

2.7 FABRICATION

A. Fabricate wall and door protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

B. Curved Panels: Preform curved semirigid, abuse-resistant sheet wall covering in factory for radius and sheet thickness as follows:

1. Sheet Thickness of 0.040 Inch: 24-inch radius.

C. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

D. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.8 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances[, fire rating,] and other conditions affecting performance of the Work.

B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Complete finishing operations, including painting, before installing wall and door protection.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.

1. Provide anchoring devices and suitable locations to withstand imposed loads.
2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches apart.
3. Adjust end caps as required to ensure tight seams.

C. Abuse-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.4 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Warm-air dryers.
3. Underlavatory guards.
4. Custodial accessories.

B. Owner-Furnished, Contractor Installed Items:

1. Soap Dispensers
2. Toilet Tissue Dispensers
3. Paper Towel Dispensers

1.3 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Include electrical characteristics.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 PUBLIC-USE WASHROOM ACCESSORIES

A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

B. Grab Bar : (keynote: 102800-7)

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick; B-6806.99 Series or comparable product by one of the following:

   a. A&J Washroom Accessories, Inc.
   b. American Specialties, Inc.; ASI Group.
   c. Bobrick Washroom Equipment, Inc.
   d. Bradley Corporation.

2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.

   a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.

4. Outside Diameter: 1-1/2 inches.
5. Configuration and Length: As indicated on Drawings.

C. Sanitary-Napkin Disposal Unit :(keynote: 102800-6)

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick B-270 or comparable product by one of the following:

a. A&J Washroom Accessories, Inc.
b. Bobrick Washroom Equipment, Inc.
c. Bradley Corporation.

2. Mounting: Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless steel, No. 4 finish (satin).

D. Sanitary-Napkin Vendor :(keynote: 102800-5)

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick B-2706 25 or comparable product by one of the following:

a. A&J Washroom Accessories, Inc.
b. Bobrick Washroom Equipment, Inc.
c. Bradley Corporation.

2. Mounting: Surface mounted.
3. Finish: satin finish stainless steel.
4. Accessories: provide part 3706-250 for free vend conversion.

E. Material and Finish: Stainless steel, No. 4 finish (satin).

F. Mirror Unit : (keynote: 102800-4)

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick B-290 or comparable product by one of the following:

a. A&J Washroom Accessories, Inc.
b. American Specialties, Inc.; ASI Group.
c. Bobrick Washroom Equipment, Inc.
d. Bradley Corporation.

2. Frame: Stainless-steel channel .

a. Corners: Welded and ground smooth.

3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.

a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.

4. Size: As indicated on Drawings.

G. Coat Hook : (keynote: 102800-11)

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick B-671or comparable product by one of the following:

    a. American Specialties, Inc.; ASI Group.
    b. Bobrick Washroom Equipment, Inc.
    c. Bradley Corporation.

2. Description: Single-prong unit.
3. Material and Finish: Stainless steel, No. 4 finish (satin) .

2.4 WARM-AIR DRYERS

A. Source Limitations: Obtain warm-air dryers from single source from single manufacturer.

B. High-Speed Warm-Air Dryer : (keynote 102800-15)

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bradley Aerix Hand Dryer, Adjustable Speed (# 2902-2874). Approved equals must be submitted prior to bidding.

    a. Operable Sample Unit must be submitted for evaluation. Noise levels will be evaluated by Owner and Architect.

2. Description: High-speed, warm-air hand dryer for rapid hand drying.
3. Mounting: Surface mounted.
4. Operation: Electronic-sensor activated with operation time of up to 60 seconds.
5. Cover Material and Finish: Stainless steel, No. 4 finish (satin) .
6. Electrical Requirements:

    a. Heating Element: 50 - 250 W.
    b. Motor: 400 - 1050 W 50/60 Hz, 110 - 120 Volts.

7. Noise Level: 68 - 75 dB.

2.5 UNDERLAVATORY GUARDS

A. Underlavatory Guard : provide at all wall hung lavatories and provide at all B44 casework units.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Plumberex Specialty Products, Inc.
b. Truebro by IPS Corporation.

2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.6 CUSTODIAL ACCESSORIES

A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.

B. Utility Shelf and Mop Holder:

1. Basis-of-Design: Subject to compliance with requirements provide Bobrick B-239, or provide comparable product by one of the following:

a. A&J Washroom Accessories, Inc.
b. American Specialties, Inc.; ASI Group.
c. Bobrick Washroom Equipment, Inc.
d. Bradley Corporation.
e. GAMCO Specialty Accessories; a division of Bobrick.

2. Description: With exposed edges turned down not less than 1/2 inch and supported by two 16 gauge triangular brackets welded to shelf underside.
3. Size: 8 inches deep by 34 inches long shelf.
4. Material and Finish: 18 gauge, type 304 satin finished stainless steel.
5. Mop/Broom Holder: Three (3) spring loaded cams with anti-slip coating. Plated steel retainers.
6. Hooks: four (4) 12 gauge hooks.

2.7 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

C. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

D. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

E. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.8 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:

a. Portable fire extinguisher.

B. Related Requirements:

1. Section 104416 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

B. Shop Drawings: For fire-protection cabinets.

1. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For each type of exposed finish required.

D. Samples for Verification: For each type of exposed finish required, prepared on samples 6 by 6 inches square.

E. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function.[Use same designations indicated on Drawings.]

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.5 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of [fire extinguishers] [fire hoses, hose valves, and hose racks] indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.3 FIRE-PROTECTION CABINET (FEC)

A. Cabinet Type: Suitable for fire extinguisher.

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

a. Guardian Fire Equipment, Inc.
b. JL Industries, Inc.; a division of the Activar Construction Products Group.
c. Larsens Manufacturing Company.
d. Modern Metal Products, Division of Technico Inc.
e. Strike First Corporation of America (The).

B. Cabinet Construction: One-hour fire rated.

1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch-thick cold-rolled steel sheet lined with minimum 5/8-inch- thick fire-barrier material. Provide factory-drilled mounting holes.

C. Cabinet Material: Aluminum sheet.

1. Shelf: Same metal and finish as cabinet.

D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).

1. Rolled-Edge Trim: 2-1/2-inch backbend depth.

E. Cabinet Trim Material: Aluminum sheet.

F. Door Material: Aluminum sheet.

G. Door Style: Vertical duo panel with frame.

H. Door Glazing: Tempered break glass.

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide manufacturer's standard.

J. Accessories:

1. Break-Glass Door Handle: Manufacturer's standard, integral to glass with the words "PULL TO BREAK GLASS" applied to handle.

2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate [as indicated] [as directed by Architect] <Insert location>.

a. Identify fire extinguisher in fire-protection cabinet with the words "[FIRE EXTINGUISHER] <Insert identification>."

1) Location: Applied to [cabinet door] [cabinet glazing] [location indicated on Drawings].
2) Application Process: [Silk-screened] [Engraved] [Etched] [Decals] [Pressure-sensitive vinyl letters].
3) Lettering Color: [Red] [Black] [White].
4) Orientation: [Vertical] [Horizontal] [As indicated on Drawings].

K. Materials:

1. Aluminum: ASTM B 221 for extruded shapes and aluminum sheet, with strength and durability characteristics of not less than Alloy 6063-T5 for aluminum sheet.

    a. Finish: Clear anodic.

2. Tempered Break Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 1.5 mm thick.

2.4 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Miter corners and grind smooth.
3. Provide factory-drilled mounting holes.
4. Prepare doors and frames to receive locks.
5. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames and grind smooth.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for hose [valves] [racks] and cabinets to verify actual locations of piping connections before cabinet installation.

B. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

1. Fire-Protection Cabinets: 54 inches above finished floor to top of fire extinguisher.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.
2. Provide inside latch and lock for break-glass panels.
3. Fire-Rated Cabinets:

a. Install cabinet with not more than 1/16-inch tolerance between pipe OD and knockout OD. Center pipe within knockout.
b. Seal through penetrations with firestopping sealant as specified in Section 078413 "Penetration Firestopping."

C. Identification:

1. Apply vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

B. Related Requirements:

1. Section 104413 "Fire Protection Cabinets."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Badger Fire Protection.
b. Guardian Fire Equipment, Inc.
c. JL Industries, Inc.; a division of the Activar Construction Products Group.
d. Larsens Manufacturing Company.
e. Strike First Corporation of America (The).

2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.

3. Valves: Manufacturer's standard.
4. Handles and Levers: Manufacturer's standard.
5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type in Steel Container : UL-rated 4-A:60-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.3 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Amerex Corporation.
b. Badger Fire Protection.
c. Guardian Fire Equipment, Inc.
d. JL Industries, Inc.; a division of the Activar Construction Products Group.
e. Larsens Manufacturing Company.
f. Strike First Corporation of America (The).

2. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: Unless otherwise noted, Top of fire extinguisher to be at 42 inches above finished floor.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416

SECTION 122413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Manually operated roller shades with single rollers.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

C. Samples: For each exposed product and for each color and texture specified, 10 inches long.

D. Roller-Shade Schedule: Use same designations indicated on Drawings.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roller shades to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide MechoShade: Mecho /5 or comparable product by one of the following:

1. Hunter Douglas Contract.
2. MechoShade Systems, Inc.
3. Nysan Solar Control Inc.; Hunter Douglas Company.
4. Draper.

B. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Stainless steel .

a. Loop Length: Full length of roller shade.
b. Limit Stops: Provide upper and lower ball stops.
c. Chain-Retainer Type: Chain tensioner, jamb mounted.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.

    a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criteria are more stringent.

B. Spring Operating Mechanisms: Roller contains spring sized to accommodate shade size indicated. Provide with positive locking mechanism that can stop shade movement at each half-turn of roller and with manufacturer's standard pull.

1. Pole: Manufacturer's standard type in length required to make operation convenient from floor level and with hook for engaging pull.

C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Drive-End Location: Right side of inside face of shade.
2. Direction of Shadeband Roll: Regular, from back of roller.
3. Shadeband-to-Roller Attachment: Removable spline fitting integral channel in tube.

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

F. Shadebands:

1. Shadeband Material: Light-filtering fabric.
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.

    a. Type: Enclosed in sealed pocket of shadeband material .
    b. Color and Finish: As selected by Architect from manufacturer's full range.

G. Installation Accessories:

1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.

    a. Shape: L-shaped.
    b. Height: Manufacturer's standard height required to conceal roller and shadeband when shade is fully open, but not less than 4 inches.

2. Endcap Covers: To cover exposed endcaps.
3. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 SHADEBAND MATERIALS

A. Light-Filtering Fabric: Woven fabric, stain and fade resistant.

1. Basis-of-Design: MechoShade: Thermo Veil 3000 Series.
2. Source: Roller-shade manufacturer.
3. Type: PVC-coated polyester.
4. Weave: Basketweave.
5. Thickness: 0.30 inches.
6. Weight: 0.18 oz / sq yd.
7. Roll Width: 72 inches.
8. Orientation on Shadeband: Up the bolt.
9. Openness Factor: 1- 2 percent.
10. Color: As selected by Architect from manufacturer's full range.

2.4 ROLLER-SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:

1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:

1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER-SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 122413

SECTION 123216 - MANUFACTURED PLASTIC-LAMINATE-FACED CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes plastic-laminate-faced cabinets of stock design.

B. Related Requirements:

1. Section 123623.13 "Plastic-Laminate-Clad Countertops."

1.3 DEFINITIONS

A. Definitions in the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" apply to the work of this Section.

B. MDF: Medium-density fiberboard.

C. Hardwood Plywood: A panel product composed of layers or plies of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive, and faced both front and back with hardwood veneers.

1.4 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show fabrication details, including types and locations of hardware. Show installation details, including field joints and filler panels. Indicate manufacturer's catalog numbers for casework.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: a certified participant in AWI's Quality Certification Program.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver casework only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.

B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period. Maintain temperature and relative humidity during the remainder of the construction period in range recommended for Project location by the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

C. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Delamination of components or other failures of glue bond.
    b. Warping of components.
    c. Failure of operating hardware.

2. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Case Systems.
2. Stevens Industries, Inc.
3. TMI Systems Design Corporation.
4. Windham Millwork, Inc.
5. Timberline Millwork.
6. RCS Millwork.

B. Source Limitations: Obtain plastic-laminate-faced cabinets from single manufacturer.

2.2 CASEWORK, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.

1. Grade: Custom.

2.3 CASEWORK

A. Design:

1. Flush overlay.

B. Grain Direction for Wood Grain Plastic Laminate:

1. Vertical on both doors and drawer fronts, with continuous vertical matching.
2. Vertical on end panels.

C. Exposed Materials:

1. Plastic Laminate: Grade HGS.

a. Colors and Patterns: See section 2.5 for basis-of-design laminate colors.

2. Unless otherwise indicated, provide specified edgebanding on all exposed edges.

D. Semiexposed Materials:

1. Thermoset Decorative Panels: Provide thermoset decorative panels for semiexposed surfaces unless otherwise indicated.

    a. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

2. Unless otherwise indicated, provide specified edgebanding on all semiexposed edges.

E. Concealed Materials:

1. Particleboard.

2.4 MATERIALS

A. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.

B. Particleboard: ANSI A208.1, Grade M-2

C. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

1. Manufacturers: Subject to compliance with requirements, provide products by the following: Refer to colors listed above.

    a. Formica Corporation.
    b. Wilsonart International.

D. Edgebanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 3 mm thick at doors and drawer fronts, 1 mm thick elsewhere.

E. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

F. Edgebanding for Thermoset Decorative Panels: PVC or polyester edgebanding matching thermoset decorative panels.

2.5 COLORS AND FINISHES

A. Thermoset Decorative Panel Colors, Patterns, and Finishes: As selected by Architect from casework manufacturer's full range.

B. Plastic-Laminate Colors, Patterns, and Finishes: As indicated on drawings.

C. PVC Edgebanding Color: As selected from casework manufacturer's full range.

2.6 FABRICATION

A. Plastic-Laminate-Faced Cabinet Construction: As required by referenced quality standard, but not less than the following:

1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch particleboard.
2. Shelves: 3/4-inch- thick particleboard.
3. Backs of Cabinets: 1/2-inch- thick particleboard or MDF where exposed, 1/4-inch hardboard dadoed into sides, bottoms, and tops where not exposed.
4. Drawer Fronts: 3/4-inch particleboard.
5. Drawer Sides and Backs: 1/2-inch solid-wood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
6. Drawer Bottoms: 1/4-inch hardwood plywood glued and dadoed into front, back, and sides of drawers.
7. Drawer Bodies: Steel drawer pans formed from 0.0359-inch- thick metal, metallic phosphate treated, and finished with manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil for topcoat and 2 mils for system.
8. Doors 48 Inches High or Less: 3/4 inch thick, with particleboard or MDF cores.
9. Doors More Than 48 Inches High: 1-1/8 inches thick, with particleboard cores.

B. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

2.7 CASEWORK HARDWARE AND ACCESSORIES

A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.

1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.

B. Butt Hinges: Chrome-plated, semiconcealed, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two hinges for doors less than 48 inches high, and provide three hinges for doors more than 48 inches high.

C. Pulls: Solid aluminum wire pulls, fastened from back with two screws. For sliding doors, provide recessed chrome-plated flush pulls. Provide two pulls for drawers more than 24 incheswide.

D. Door Catches: Zinc-plated, dual, self-aligning, permanent magnet catch. Provide two catches on doors more than 48 inches high.

E. Drawer Slides: BHMA A156.9, Type B05091.

1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-overtravel-extension type; zinc-plated, steel ball-bearing slides.
2. Box Drawer Slides: Grade 1, for drawers not more than 6 inches high and 24 inches wide.
3. File Drawer Slides: Grade 1HD-200, for drawers more than 6 inches high or 24 inches wide.

F. Drawer and Hinged Door Locks: Cylindrical (cam) type, five-pin tumbler, brass with chrome-plated finish, and complying with BHMA A156.11, Grade 1.

1. Provide a minimum of two keys per lock and six master keys.
2. Provide locks where indicated on drawings.

G. Adjustable Shelf Supports: Single-pin metal L-shaped shelf rests complying with BHMA A156.9, Type B04013. basis-of-design: KV 345 or similar.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CASEWORK INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Install casework level, plumb, and true; shim as required, using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

C. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch of a single plane. Align similar adjoining doors and drawers to a tolerance of 1/16 inch. Bolt adjacent cabinets together with joints flush, tight, and uniform.

D. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch of a single plane. Fasten to hanging strips, masonry, framing, wood blocking, or reinforcements in walls and partitions. Align similar adjoining doors to a tolerance of 1/16 inch.

E. Fasten cabinets to adjacent cabinets and to masonry, framing, wood blocking, or reinforcements in walls and partitions to comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

F. Install hardware uniformly and precisely. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.

G. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 CLEANING

A. Repair or remove and replace defective work as directed on completion of installation.

B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 123216

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes plastic-laminate-clad countertops.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For plastic-laminate-clad countertops.

1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
2. Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.

B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.

C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 FABRICATORS

A. Fabricators: Subject to compliance with requirements, provide products by one of the following:

1. Case Systems.
2. Stevens Industries, Inc.
3. TMI.
4. Windham Millwork, Inc.
5. Timberline Millwork.
6. RCS Millwork.

2.2 PLASTIC-LAMINATE-CLAD COUNTERTOPS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.

1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that countertops comply with requirements of grades specified.

2. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Grade: Custom.

C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS .

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Formica Corporation.
b. Wilsonart.

D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As indicated on drawings.

E. Edge Treatment: 3-mm PVC edging.

F. Core Material: Particleboard made with exterior glue.

G. Core Material at Sinks: exterior-grade plywood.

H. Core Thickness: 1-1/8 inch.

I. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.

2.3 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.

2.4 ACCESSORIES

A. Wire-Management Grommets: Circular, molded-plastic grommets and matching plastic caps with slot for wire passage.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Doug Mockett & Company, Inc.

2. Outside Diameter: 2 inches.
3. Color: As selected by architect from manufacturer's standards.,

B. Countertop Support Brackets: Metal brackets, capable of supporting 1420 lbs to 2920 lbs per pair.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. A&M Standard Brackets.

2. Color: As selected by architect from manufacturer's standards.,

2.5 MISCELLANEOUS MATERIALS

A. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Adhesive for Bonding Plastic Laminate: Contact cement.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.6 FABRICATION

A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets. Ease edges to radius indicated for the following:

1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended, and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of cutouts by saturating with varnish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.2 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.

1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.

1. Secure field joints in countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inchesvariation from a straight, level plane.

2. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
3. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semiexposed surfaces.

C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION 123623.13

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Solid surface material for window sills.

1.3 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

1.4 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements before countertop fabrication is complete.

1.5 COORDINATION

A. Coordinate locations of utilities that will penetrate sills, countertops, or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE SILL MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. E. I. du Pont de Nemours and Company.
b. Formica Corporation.
c. Wilsonart International Holdings, Inc.

2. Colors and Patterns: As indicated on drawings.

a. Alternate colors/patterns must include grades 1 - 4 from solid surface manufacturer.

B. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.

C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Grade: Custom.

B. Configuration:

1. Front: 1-1/2-inch laminated bullnose, unless noted different on drawings.

C. Sills & Countertops: 1/2-inch- thick, solid surface material.

D. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

E. Joints: Fabricate countertops without joints.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

1. Seal edges of cutouts in particleboard subtops by saturating with varnish.

H. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16