PROJECT MANUAL

ECOTOURISM VISITORS CENTER

FORT WASHAKIE, WY



BRUNTON

SECTION 00 0105
CERTIFICATIONS PAGE

ARCHITECTURAL

I HEREBY CERTIFY THAT THESE SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF WYOMING.

COREY A. BRUNTON _____ LIC. NO. C-3502

CIVIL

I HEREBY CERTIFY THAT THESE SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WYOMING.

ANTHONY P. MACDONALD _____ LIC. NO. 13597

STRUCTURAL

I HEREBY CERTIFY THAT THESE SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WYOMING.

Lucas G. Fried _____ LIC. NO. 20218

MECHANICAL

I HEREBY CERTIFY THAT THESE SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WYOMING.

JORDAN DEWIT _____ LIC. NO. 22036

ELECTRICAL

I HEREBY CERTIFY THAT THESE SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WYOMING.

JEFF RENKEN _____ LIC. NO. 22053

DATED THIS 2ND DAY OF NOVEMBER, 2026

END OF SECTION 00 0105

SECTION 00 0110
TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

00 0105 - Certifications Page
00 0110 - Table of Contents
00 1113 - Advertisement for Bids
00 2113 - Instructions to Bidders
00 3100 - Available Project Information
00 3110 - Subsurface Exploration and Geotechnical Report
00 4100 - Bid Form
00 5000 - Contracting Forms and Supplements
00 7200 - General Conditions
00 7210 - AIA Document A101-2017
00 7215 - AIA Document A201-2017
00 7300 - Supplementary Conditions

SPECIFICATIONS

DIVISION 01 -- GENERAL REQUIREMENTS

01 1000 - Summary
01 2000 - Price and Payment Procedures
01 2010# - Prevailing Wages
01 2400 - Electronic CAD-Revit File Request
01 2410 - CAD-Revit Waiver
01 2500 - Substitution Procedures
01 2510 - CSI_1.5C Substitution Request Form During Bidding
01 2520 - CSI_13.1A Substitution Request Form After Bidding
01 3000 - Administrative Requirements
01 4000 - Quality Requirements
01 4533 - Code-Required Special Inspections
01 5000 - Temporary Facilities and Controls
01 5100 - Temporary Utilities
01 5110# - Safety
01 6000 - Product Requirements
01 7000 - Execution and Closeout Requirements
01 7419 - Construction Waste Management and Disposal
01 7800 - Closeout Submittals

DIVISION 03 -- CONCRETE

03 0516 - Underslab Vapor Barrier - Stego Industries
03 1000 - Concrete Forming and Accessories
03 2000 - Concrete Reinforcing
03 3000 - Cast-in-Place Concrete

DIVISION 04 -- MASONRY

04 2616 - Adhered Masonry Veneer

04 7200 - Cast Stone Masonry

DIVISION 05 -- METALS

05 1200 - Structural Steel Framing

05 3100 - Steel Decking

05 4000 - Cold-Formed Metal Framing

05 5000 - Metal Fabrications

DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

06 1000 - Rough Carpentry

06 2000 - Finish Carpentry

06 4100 - Architectural Wood Casework

06 8316 - Fiberglass Reinforced Paneling

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

07 1113 - Bituminous Dampproofing

07 2100 - Thermal Insulation

07 2119 - Foamed-In-Place Insulation

07 2500 - Weather Barriers

07 4113.10 - Metal Panels

07 4646 - Fiber Cement Panels

07 5300 - Elastomeric Membrane Roofing

07 6200 - Sheet Metal Flashing and Trim

07 9200 - Joint Sealants

DIVISION 08 -- OPENINGS

08 1113 - Hollow Metal Doors and Frames

08 1416 - Flush Wood Doors

08 3100 - Access Doors and Panels

08 3613 - Sectional Doors

08 4313 - Aluminum-Framed Storefronts

08 7100 - Door Hardware

08 8000 - Glazing

08 8300 - Mirrors

DIVISION 09 -- FINISHES

09 2116 - Gypsum Board Assemblies

09 2216 - Non-Structural Metal Framing

09 3000 - Tiling

09 5100 - Acoustical Ceilings

09 6566 - Resilient Athletic Flooring

09 6700 - Fluid-Applied Flooring

09 6813 - Tile Carpeting

09 7200 - Wall Coverings

09 8430 - Sound-Absorbing Wall and Ceiling Units
09 9000 - Painting and Coating
DIVISION 10 -- SPECIALTIES
10 1400 - Signage
10 2113.13 - Metal Toilet Compartments
10 2601 - Wall and Corner Guards
10 2800 - Toilet, Bath, and Laundry Accessories
10 4400 - Fire Protection Specialties
10 5113 - Metal Lockers and Storage Systems
10 5723 - Closet and Utility Shelving
10 7316.13 - Metal Canopies
DIVISION 11 -- EQUIPMENT
11 4000 - Foodservice Equipment
DIVISION 12 -- FURNISHINGS
12 2400 - Roller Shades
12 3600 - Countertops
DIVISION 13 -- SPECIAL CONSTRUCTION
13 3419 - Metal Building Systems
DIVISION 21 -- FIRE SUPPRESSION
21 0100 - General Provisions
21 0500 - Fire Suppression
DIVISION 22 -- PLUMBING
22 0100 - General Provisions
22 0400 - Plumbing
22 0700 - Insulation and Piping Identification
DIVISION 23 -- HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)
23 0100 - General Provisions
23 0700 - Insulation and Piping Identification
23 0800 - Ventilation and Air Conditioning
DIVISION 25 -- INTEGRATED AUTOMATION (NOT USED)
DIVISION 26 -- ELECTRICAL
26 0100 - Common Electrical Requirements
26 0500 - Basic Electrical Materials and Methods
26 0573 - Arc Flash Hazard Analysis/Short-Circuit/Coordination Study
26 0600 - Grounding and Bonding
26 1200 - Conductors and Cables
26 1300 - Raceways and Boxes
26 1400 - Wiring Devices
26 1450 - Lighting Control Devices
26 2310 - Packaged Engine Generators (NG)
26 2890 - Surge Protection Devices (SPD's)

26 4100 - Enclosed Switches and Circuit Breakers
26 4150 - Transfer Switches
26 4200 - Enclosed Controllers
26 4420 - Panelboards
26 4910 - Fuses
26 5119 - LED Lighting
DIVISION 27 -- COMMUNICATIONS (NOT USED)
DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY
28 7210 - Fire Alarm
DIVISION 31 -- EARTHWORK (NOT USED)
DIVISION 32 -- EXTERIOR IMPROVEMENTS (NOT USED)
DIVISION 33 -- UTILITIES (NOT USED)

TABLE OF CONTENTS - MECHANICAL

DIVISION 21 – FIRE SUPPRESSION

SECTION	TITLE	NO. OF PAGES
210100	GENERAL PROVISIONS	16
210500	FIRE SUPPRESSION	3

DIVISION 22 - PLUMBING AND HEATING HYDRONICS

SECTION	TITLE	NO. OF PAGES
220100	GENERAL PROVISIONS	21
220400	PLUMBING	9
220700	INSULATION AND PIPING IDENTIFICATION	5

DIVISION 23 - HEATING, VENTILATION AND AIR CONDITIONING

SECTION	TITLE	NO. OF PAGES
230100	GENERAL PROVISIONS	16
230700	INSULATION AND PIPING IDENTIFICATION	3
230800	VENTILATION AND AIR CONDITIONING	13

PROJECT: ECOTOURISM VISITOR CENTER
FORT WASHAKIE, WYOMING

ACEI PROJECT NO.: 126019

DATE: August 3, 2026

DIVISION 26-27-28 - ELECTRICAL

TABLE OF CONTENTS

SECTION	TITLE	NO. OF PAGES
260100	COMMON ELECTRICAL REQUIREMENTS	8
260500	BASIC ELECTRICAL MATERIALS AND METHODS	10
260573	ARC FLASH HAZARD ANALYSIS/SHORT-CIRCUIT/COORDINATION STUDY	8
260600	GROUNDING AND BONDING	6
261200	CONDUCTORS AND CABLES	4
261300	RACEWAYS AND BOXES	10
261400	WIRING DEVICES	6
261450	LIGHTING CONTROL DEVICES	8
262310	PACKAGED ENGINE GENERATORS (NG)	14
262890	SURGE PROTECTION DEVICES (SPD's)	4
264100	ENCLOSED SWITCHES AND CIRCUIT BREAKERS	6
264150	TRANSFER SWITCHES	8
264200	ENCLOSED CONTROLLERS	6
264420	PANELBOARDS	6
264910	FUSES	4
265119	LED LIGHTING	6
287210	FIRE ALARM	14

PROJECT: ECOTOURISM VISITORS CENTER
LANDER, WY

ACEI NO: 126019

DATE: October 26, 2026

SECTION 00 1113
ADVERTISEMENT FOR BIDS

FROM:

THE OWNER (HEREINAFTER REFERRED TO AS OWNER):

Wind River Sage Fund, Inc.

Address:

Frank B. Wise Business Center
3 Ethete Road
Or P.O. Box 661
Fort Washakie, WY 82514

AND THE ARCHITECT (HEREINAFTER REFERRED TO AS ARCHITECT):

Brunton Architects

225 Belgrade Avenue

North Mankato, Minnesota 56003

DATE: NOVEMBER 3, 2026

TO: POTENTIAL BIDDERS

The Wind River Sage Fund, Inc. is seeking competitive bids for the construction of a 17,000 s.f. pre-engineered metal building which includes reception and lobby, gift shop, office and training, vehicle storage, and support spaces. The building will include all necessary mechanical, electrical, plumbing, and fire protection systems. This project is located in Fort Washakie, Wyoming and is estimated to be complete on the first day of March, 2028.

Sealed Bids will be received until 2:00 pm MT on the 3rd day of December 2026 at the Frank B. Wise Business Center, located at 3 Ethete Road, Fort Washakie, WY 82514. Late bids will not be opened or received. Bids must be placed in a sealed envelope and labeled, "Ecotourism Visitors Center Bid". No faxed or email bids will be accepted. All bids will be publicly read aloud at the close of the bid.

Bidders will be required to provide Bid security in the form of a Bid Bond of a sum no less than 5 percent of the Bid Amount. This Bid Bond must accompany the bids that are delivered in a sealed envelope at the time of bidding.

Bid Documents for a "Single Prime" - Stipulated Sum contract may be downloaded from Quest CDN at www.questcdn.com, ebid project number 10428210.

Refer to other bidding requirements described in Document 00 2113 - Instructions to Bidders and Document 00 3100 - Available Project Information.

Submit your offer on the Bid Form provided. Bidders may supplement this form as appropriate.

Your offer will be required to be submitted under a condition of irrevocability for a period of 45 days after submission.

PROJECT IS SUBJECT TO THE DAVIS-BACON WAGE DETERMINATION ACT

Comply with federal commercial construction prevailing-wage rates. Wage determination is subject to change without notice; it is the Contractors responsibility to ensure they are using the most recent wage decision.

This project will be run as TAX EXEMPT. Please provide your bids, less tax, with separate numbers for performed work and materials on the bid form included in these specifications.

TERO/INDIAN PREFERENCE NOTICE: This project is subject to Title X of the Shoshone and Arapaho Law and Order Code, the Tribal Employment Rights Office (TERO) Rules of Administration, and all applicable TERO requirements. The successful bidder and its subcontractors shall comply with applicable Indian employment and contracting preference, certification, subcontracting, reporting, and employment-rights fee requirements. Contractors

are responsible for coordinating with TERO regarding project-specific compliance requirements prior to commencing work.

The Owner reserves the right to accept or reject any or all offers.

END OF BID SOLICITATION

SECTION 00 2113
INSTRUCTIONS TO BIDDERS

SUMMARY

1.01 SEE AIA A701, (1997 EDITION), INSTRUCTIONS TO BIDDERS AVAILABLE AT BRUNTON ARCHITECTS & ENGINEERS.

1.02 DOCUMENT INCLUDES

A. Invitation
   1. Bid Submission
   2. Intent
   3. Work Identified in the Contract Documents
   4. Contract Time

B. Bid Documents and Contract Documents
   1. Definitions
   2. Contract Documents Identification
   3. Availability
   4. Examination
   5. Inquiries/Addenda
   6. Product/Assembly/System Substitutions

C. Site Assessment
   1. Site Examination

D. Qualifications
   1. Qualifications
   2. Subcontractors/Suppliers/Others

E. Bid Submission
   1. Submission Procedure
   2. Bid Ineligibility

F. Bid Enclosures/Requirements
   1. Security Deposit
   2. Performance Assurance
   3. Insurance
   4. Bid Form Requirements
   5. Sales and Use Taxes
   6. Permits
   7. Fees for Changes in the Work
   8. Bid Form Signature

G. Offer Acceptance/Rejection
   1. Duration of Offer
   2. Acceptance of Offer

1.03 RELATED DOCUMENTS

A. Document 00 1113 - Advertisement for Bids.

B. Document 00 4100 - Bid Form.

INVITATION

2.01 BID SUBMISSION

A. Bids signedand under seal, executed, and dated will be received at the Frank B. Wise Business Center, located at 3 Ethete Road, Fort Washakie, WY 82514. before 2:00 pm MT time on the 3rd day of December 2026.

B. Offers submitted after the above time shall be returned to the bidder unopened.

C. Offers will be opened publicly immediately after the time for receipt of bids.

D. Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer.

2.02 INTENT

A. The intent of this Bid request is to obtain an offer to perform work to complete the construction of a 17,000 s.f. pre-engineered metal building which includes reception and lobby, gift shop, office and training, vehicle storage, and support spaces. The building will include all necessary mechanical, electrical, plumbing, and fire protection systems.

2.03 WORK IDENTIFIED IN THE CONTRACT DOCUMENTS

A. Work of this proposed Contract comprises building construction and site development, including, but not limited to, general construction, structural, mechanical, and electrical Work.

2.04 CONTRACT TIME

A. Project is to be substantially complete by March 1, 2028.

B. If the Contractor fails to achieve Substantial Completion by the date stated in the Agreement, liquidated damages in the amount of $500 per calendar day shall be charged to the Contractor for each day past the Substantial Completion date until the Project is completed.

BID DOCUMENTS AND CONTRACT DOCUMENTS

3.01 DEFINITIONS

A. Bid Documents: Contract Documents supplemented withInstructions to Bidders,Information Available to Bidders, Bid Form Supplements To Bid Forms and Appendices identified.

B. Bid, Offer, or Bidding: Act of submitting an offer under seal.

C. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.

3.02 CONTRACT DOCUMENTS IDENTIFICATION

A. The Contract Documents are identified as Project Number 25494-1, as prepared by Brunton Architects who is located at 225 Belgrade Avenue, North Mankato, MN 56003, and with contents as identified in the Project Manual.

3.03 AVAILABILITY

A. Complete digital Bid Documents for use by Contractors submitting a bid are available at www.QuestCDN.com. Digital plan documents may be downloaded for a non-refundable fee of $22.00 by inputting Quest Project No. 10428210 on the website' s Project search page. Please contact QuestCDN at (952) 233-1632 or info@QuestCDN.com for assistance in free membership registration, downloading, and working with this digital project information.

B. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes.

3.04 EXAMINATION

A. Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.

B. Immediately notify Architect upon finding discrepancies or omissions in the Bid Documents.

3.05 INQUIRIES/ADDENDA

A. Direct questions to Georgia Ulmer, email; georgiau@bruntonarchitects.com.

B. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount.

C. Verbal answers are not binding on any party.

D. Clarifications requested by bidders must be in writing not less than 14 calendar days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be posted on the Quest CDN website.

3.06 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS

A. Where the Bid Documents stipulate a particular product, substitutions will be considered up to 14 days before receipt of bids.

B. When a request to substitute a product is made, Architect may approve the substitution and will issue an Addendum to Quest CDN.

C. The submission shall provide sufficient information to determine acceptability of such products.

D. Provide complete information on required revisions to other work to accommodate each proposed substitution.

E. Provide products as specified unless substitutions are submitted in this manner and accepted.

F. See Section 01 6000 - Product Requirements for additional requirements.

SITE ASSESSMENT

4.01 SITE EXAMINATION

A. Examine the project site before submitting a bid.

QUALIFICATIONS

5.01 EVIDENCE OF QUALIFICATIONS

A. To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit written evidence of financial position, license to perform work in the State.

5.02 SUBCONTRACTORS/SUPPLIERS/OTHERS

A. Owner reserves the right to reject a proposed subcontractor for reasonable cause.

BID SUBMISSION

6.01 SUBMISSION PROCEDURE

A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.

B. Submit one copy of the executed offer on the Bid Forms provided, signed and sealed with the required security in a closed opaque envelope, clearly identified with bidder's name, project name and Owner's name on the outside.

6.02 BID INELIGIBILITY

A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Owner, be declared unacceptable.

B. Bid Forms, Appendices, and enclosures that are improperly prepared may, at the discretion of Owner, be declared unacceptable.

BID ENCLOSURES/REQUIREMENTS

7.01 SECURITY DEPOSIT

A. Bids shall be accompanied by a security deposit as follows:
   1. Bid Bond of a sum no less than 5 percent of the Bid Amounton AIA A310 Bid Bond Form.

B. Endorse the Bid Bond in the name of the Owner, Wind River Sage Fund, Inc. as obligee, signed and sealed by the principal and surety.

C. The security deposit will be returned after delivery to the Owner of the required Performance and Payment Bond(s) by the accepted bidder.

D. Include the cost of bid security in the Bid Amount.

E. After a bid has been accepted, all securities will be returned to the respective bidders .

F. If no contract is awarded, all security deposits will be returned.

7.02 PERFORMANCE ASSURANCE

A. Accepted Bidders: Provide a Performance and Payment bond as described in the General Conditions. Bonds shall be in the amount of 100% of the construction cost of the bid total amount.

B. Include the cost of Performance and Payment Bonds in the Bid Amount.

C. Lien waivers will be required of all contractors and suppliers of materials for the project. These waivers shall be collected monthly. Subsequent payments will not be approved until lien waivers have been submitted attesting to payments for labor and materials provided.

7.03 INSURANCE

A. Provide an executed "Undertaking of Insurance" on a standard form provided by the insurance company stating their intention to provide insurance to the bidder in accordance with the insurance requirements of the Contract Documents. Insurance certificate shall be submitted prior to the signing of the Agreement.

B. Builders Risk/All Risk shall be provided and cost included by the General Contractor.

7.04 BID FORM REQUIREMENTS

A. Complete all requested information in the Bid Form and Appendices.

7.05 PERMITS

A. The Contractor shall contact the jurisdiction where the Project is located for an application for Construction (Building Permit) for the entire work of the bid package being bid. The **General Contractor** will be responsible for the cost of the building permit. Contractor shall be responsible for preparing and submitting the application and any necessary attachments.

7.06 FEES FOR CHANGES IN THE WORK

A. Contractor shall use the overhead and profit fees on own Work and Work by subcontractors, applicable for Changes in the Work, whether additions to or deductions from the Work on which the Bid Amount is based. These fees are listed on the Bid Form.

7.07 BID FORM SIGNATURE

A. The Bid Form shall be signed by the bidder, as follows:
   1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
   2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
   3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.

OFFER ACCEPTANCE/REJECTION

8.01 DURATION OF OFFER

A. Bids shall remain open to acceptanceand shall be irrevocable for a period of forty-five (45) days after the bid closing date.

8.02 ACCEPTANCE OF OFFER

A. Owner reserves the right to accept or reject any or all offers.

B. After acceptance by Owner, Architect on behalf of Owner, will issue to the successful bidder, a written Notice To Proceed.

END OF INSTRUCTIONS TO BIDDERS

SECTION 00 3100
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of Contract Documents, as follows:

B. Geotechnical Report: Entitled Subsurface Exploration and Geotechnical Engineering Report - Ecotourism Visitors Center - Freemont County, Wyoming from Inberg-Miller Engineers, dated March 4, 2026. Including Addendum No. 1 dated October 16, 2026.

1. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
2. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in Contract Documents.
3. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION









GEOTECHNICAL ENGINEERING REPORT

WIND RIVER TRIBAL FISH AND GAME OFFICE

Prepared for:
Leslie Shakespeare
Wind River Development Fund
3 Ethete Road
Fort Washakie, WY 82514

March 4, 2026

By:

10 YEARS
Integrity • Excellence
Exceptional Service • Professional Growth
AdvancedGeotechnical

Letter of Transmittal: Subsurface and Geotechnical Engineering Report

3440 Bypass Blvd. Casper, Wyoming 82601

March 4, 2026

Leslie Shakespeare
Wind River Development Fund
3 Ethete Road
Fort Washakie, WY 82514

Mr. Shakespeare,

We are pleased to provide you with this geotechnical engineering report for the Wind River Tribal Fish and Game Office.

Our experience and that of our profession clearly indicate that the risk of costly design, construction, and maintenance problems can be significantly lowered by retaining the design geotechnical engineering firm of record to review the project plans and specifications and provide geotechnical observation services during construction. Please keep us informed of the design and construction progress of the project as we are happy to provide additional information as questions or concerns arise. Please contact us at 307-439-5439 to further discuss these project-specific services.

We look forward to working with you through this construction period and subsequent projects in the future!

Regards,

Shantel Ramlo, P.E.
Geotechnical Engineer

Professional Engineer
SHANTEL RAMLO
20105
WYOMING
Digitally signed by Shantel Ramlo
Date: 2026.03.04 17:30:55-06'00'

Table of Contents

Introduction 1
Summary of conditions 1
Proposed construction 1
Exploration and Laboratory Techniques Performed 2
Site Conditions 2
Subsurface Conditions 2
Site geology 2
Soil conditions 2
Subgrade Strength 3
Groundwater 3
Recommendations 4
Earthwork 4
Foundations 5
Deep foundations 5
Shallow foundations 6
Slab-on-grade 7
Lateral earth pressures 8
Corrosion resistance 8
Seismic site classification 9
Pavement section design 10
Site drainage 10
Construction Monitoring 11
Limitations and Use of This Report 11
Closure 12

Appendix A

Site and Boring Location Map
Boring Logs
Laboratory Testing Results
Dynamic Cone Penetration (DCP) Reports

Introduction

Summary of conditions

On February 5 and 6, 2026, Advanced Geotechnical Solutions, Inc. (AGS) explored the project site, located east of Fort Washakie, Wyoming, according to our submitted and amended Proposal for Subsurface Exploration and Geotechnical Engineering, dated January 16, 2026.

Soils encountered at the site consisted of sandy silt and silty sand overlying dense silty gravelly sand. These soils are consistent with expected alluvial sediments. Groundwater was encountered at a depth of 7 feet to 8 feet below the ground surface.

The primary concern with construction at the site is the highly compressible surficial silt and silty sand. These soils are likely to be susceptible to significant settlement under structural loading. Therefore, we recommend that the proposed structure be founded on deep foundations embedded into the dense gravelly sand at depths of approximately 12 to 15 feet. We have provided design values for drilled cast-in-place concrete piers, driven piles, and helical screw piles. While drilled piers are the more common foundation in the area, it should be noted that drilled piers will likely require significant dewatering and casing to prevent collapse into the auger-drilled excavations. By contrast, driven piles and helical screw piles can be installed with relative ease in these soft soils.

Alternatively, the building may be supported by shallow foundations. To reduce the total settlement experienced, the native soils beneath the foundations should be overexcavated and replaced with at least 36 inches of properly conditioned, compacted, and tested engineered fill. However, similar to drilled pier foundations, contractors may experience difficulty working with the weak, saturated subgrade soils. We have included some suggestions for managing these conditions if encountered, including dewatering, temporary shoring, geosynthetic reinforcement, and additional overexcavation.

Floors may be constructed on standard slabs-on-grade bearing on a minimum 18 inches of overexcavation and replacement. We recommend that the upper 6 inches of the replacement material consist of WYDOT Grade W aggregate, with the remaining portion meeting engineered fill requirements set out in this report.

Dynamic Cone Penetration (DCP) tests indicate moderate subgrade strengths across the site. For light vehicle parking, we recommend a minimum section of 4 inches of asphalt with 6 inches of aggregate base. Alternatively, these pavements may be constructed with 5 inches of concrete. Driving lanes and loading areas may be constructed with 4 inches of asphalt and 8 inches of base, or alternatively, 6.5 inches of concrete.

Proposed construction

We understand the building is proposed to be a single-story structure with a footprint of approximately 17,000 square feet. The proposed construction is a steel-framed, Pre-Engineering Metal Building (PEMB), and has been determined to meet the Class IV building type.

We anticipate the structure to be lightly to moderately loaded, and wall and column loads will not exceed two kips per linear foot and 65 kips, respectively.

Although grading plans were not provided to us prior to the issuance of this report, the site is relatively level, and therefore, we do not anticipate cuts or fills to exceed 3 feet. However, if this assumption is incorrect, please contact us for updated engineering analyses, as greater cut and fill depths could impact the project.

The above information was provided by Lucus Fried with Albertson Engineering, Inc.

Exploration and Laboratory Techniques Performed

On February 5 and 6, 2026, we performed 7 test borings at the site to depths ranging from 6.5 feet to 21.5 feet. The borings were performed using 3.25-inch I.D. hollow stem augers advanced with a Diedrich D-120 truck-mounted drill rig.

Soil samples were collected with 2-inch O.D. standard split spoon samplers. The samples were sealed to prevent loss of moisture content. Field observations and sampling were performed by a geotechnical engineer.

To help define subgrade strength for pavement design, we performed 2 Dynamic Cone Penetration (DCP) tests to depths of approximately 5 to 6 feet. The DCP tests were performed using a Kessler K-100 Dynamic Cone Penetrometer according to test specifications modified from ASTM D6951.

Laboratory testing to determine the material classifications and strength properties was performed. These tests included the following modified test methods:

Test	*ASTM*
Moisture Content	D2216
Sieve Analysis	D422
Plasticity Index	D4318
Direct Shear	D3080
pH, Sulfate Content, Chloride Content	

The laboratory-determined soil properties were used to enhance the field logs and, in some cases, modify the soil type determined during exploration. The logs and laboratory analyses can be found in Appendix A.

Site Conditions

The project site is located approximately 2.3 miles east of Fort Washakie, Wyoming, on Ethete Road. The site is undeveloped and consisted of native plants at the time of our exploration. An old dirt path exists just to the west of the project site. Across the road from the project site lies a mineral hot spring, which may have deposited minerals in and around the area.

Subsurface Conditions

Site geology

According to the USGS, the site reportedly lies within an alluvial depositional environment. Alluvium is deposited via streams and rivers and tends to be highly variable. This results in a soil that may contain particles ranging from gravel and sand to silt and clay. This particular area is known to have a significant presence of cobbles, which has the potential to impact construction. However, none of our borings encountered cobbles.

Soil conditions

The soils encountered remained relatively consistent across all borings. The upper 1.5 to 2.5 feet of soil consisted of silt. This silt is considered to be in a soft to medium stiff condition, according to standardized blow counts collected during exploration. The silt was found to be slightly plastic and contained approximately 71 percent fines.

Below the silt layer, the soil in all borings transitioned to a loose to very loose non-plastic sandy silt and silty sand. The upper half of this layer is more silty, with approximately 60 to 61 percent fines. The layer gradually becomes more granular with depth, and at 7 to 10 feet below the surface, the soil may be classified as a silty sand with 31 to 40 percent fines. This soil layer also contains a significant presence of small shells, ranging from 3 to 9 millimeters in length. Due to the project site's placement within an alluvial environment, these shells likely originate upstream of the site.

The soil abruptly transitions to silty gravelly sand between 12 and 15 feet, depending on the boring. The gravelly sand is generally considered to be in a dense condition, according to standardized blow counts collected during exploration. This gravelly layer is non-plastic, with 10 to 17 percent fines, and is composed mainly of bluish-gray igneous and metamorphic rocks. This layer is also unlikely to originate from this project site and was gradually built up by the nearby river.

Laboratory testing was performed on samples at approximate foundation depths to determine corrosivity properties. The results are shown in the table below, and the full reports can be found in Appendix A:

Sample	*Soil Type*	*pH*	*Sulfate (ppm)*	*Chloride (ppm)*
B-2-4	Silty sand	8.2	349	57
B-4-3	Silty sand	8.7	1,810	295
B-6-3	Sandy silt	7.8	4,000	332

Soils are variable by nature; therefore, the boring logs and laboratory analyses located in the appendices should be reviewed in detail for a better understanding of the soil conditions of the site. The lines designating the interface between layers on the exploration logs were determined using visual observations. The transition between the materials may be abrupt or gradual.

Subgrade Strength

To help characterize the in-situ subgrade strength, two Dynamic Cone Penetration (DCP) tests were performed. The correlated minimum and average California Bearing Ratios (CBRs) are tabulated below for each DCP test. The full DCP reports are also included in Appendix A.

DCP	*CBR*	
	Average	*Minimum*
B-2	7	3.7
B-6	8	3.7

Groundwater

The following table indicates the groundwater occurrence during our exploration. However, groundwater elevations are seldom static over a period of months and years. Factors such as seasonal moisture variations and extended periods of precipitation and drought may cause the groundwater elevation to fluctuate by many feet.

Boring	*Measured Depth (ft)*
B-1	8
B-2	7
B-3	8
B-4	8
B-5	8
B-6	8
B-7	Not encountered

Recommendations

Earthwork

The following soil types, as defined by the AASHTO classification system, may be considered appropriate for imported fill soil and engineered fill:

	Engineered Fill AASHTO Classification			
Soil Type	A-1-a	A-1-b	A-2-4	A-3

Additional recommendations are listed below:

Soil Type	*Compaction Effort*	*Percent Compaction*	*Moisture Condition Range*	*Lift Thickness (loose) (in)*
Native soils	Standard (ASTM D698)	95	-4% < Optimum < +2%	8
Aggregate	Standard (ASTM D698)	95	-4% < Optimum < +2%	8
Engineered Fill	Standard (ASTM D698)	95	-4% < Optimum < +2%	8

Soils in non-structural areas of the site may be compacted to 90 percent of the above-indicated ASTM determination. All soils within a zone extending at least 10 feet outside of the building footprint and other structures, such as parking and driveways, are considered structural.

Under no circumstances should frozen fill soils be considered appropriate for construction. In addition, fill soils should be free of snow, ice, deleterious material, and cobbles larger than 3 inches in diameter. Recycled material should not be imported for any use on-site without extensive material property testing and explicit approval of the geotechnical engineer of record.

Soils within excavations and prepared subgrade areas should be observed by an experienced geotechnical engineer prior to placing building materials. These soils should be observed for conformity with those soils explored and subsequently relied on in this report.

Excavations should be sloped, benched, shored, or made safe for entry by use of trench boxes as required by the standards of 29 CFR Part 1926. For planning purposes only, we recommend that dry to wet silts and sands to depths of approximately 12 to 15 feet be considered OSHA Type C soils. Trench boxing or temporary shoring will likely be required for all excavations, especially for excavations nearing the groundwater table depth. The contractor is solely responsible for designing and constructing stable excavations.

Foundations

Deep foundations

The soils at the site consist of loose to very loose silty sand and medium stiff to soft silty soils. We anticipate that these soils will be highly compressible under structural loads.

Therefore, we recommend that the proposed building be founded on drilled cast-in-place concrete piers, driven piles, or helical screw piles. Drilled piers should extend to and penetrate the bluish gray silty gravelly sand by at least 3 feet. The capacity and total depth of helical screw piles are determined by the torque produced during pile installation and are highly dependent on the lead section helix configuration and the shaft size of the piles. Similarly, driven piles may reach the required capacity before the target depth, as indicated by pile driving criteria or dynamic pile driving analyzers (PDAs). We anticipate that helical piles or driven piles may be required to extend to the dense gravelly sand at depths of approximately 12 to 15 feet.

The following tables provide recommendations for the design and construction of recommended deep foundations:

LPILE Design Information	*Design Value*	
	Silty sand/ sandy silt	Gravelly sand
LPILE material type	4	4
Unit weight (pcf)	110	129
Friction angle (deg.)	33	36
Static soil modulus (pci)	20	125

Drilled Cast-in-Place Piers	*Design Value*	
	Silty sand/ sandy silt	Gravelly sand
Allowable end bearing capacity (psf)	N/A	10,000
Recommended side friction capacity (psf) (compression)	110	300
Recommended side friction capacity (psf) (tension)	55	150
Minimum embedment depth (ft)	N/A	3
Minimum pier length (ft)	14	
Recommended minimum pier diameter (in)	18	
Minimum pier spacing (with no capacity reduction)	Four pier diameters	
Casing needed	Required	
Air voids under grade beams	Not required	
Geotechnical engineer construction observation	Required	

Driven Piles	*Design Value*	
	Silty sand/ sandy silt	Gravelly sand
Allowable end bearing capacity (psf)	N/A	10,000
Recommended side friction capacity (psf) (compression)	100	250
Recommended side friction capacity (psf) (tension)	50	125
Minimum pile length (ft)	14	
Recommended minimum pile area (in)	144	
Minimum pile spacing (with no capacity reduction)	Four pile diameters	
Air voids under grade beams	Not required	
Geotechnical engineer construction observation	Required	

Helical Screw Piles	*Design Value*	
	Silty sand/ sandy silt	Gravelly sand
Allowable end bearing capacity (psf)	N/A	10,000
Minimum pile length (ft)	14	
Recommended minimum helix diameter (in)	6	
Minimum pile spacing (with no capacity reduction)	Four helix diameters	
Air voids under grade beams	Not required	
Geotechnical engineer construction observation	Required	

Groundwater was encountered during drilling operations at a depth of approximately 7 to 8 feet. Additionally, the surficial soils at the site generally consist of loose, cohesionless silts and sands that we expect will be prone to collapse into open excavations. Therefore, the drilling contractor should be prepared to case the entirety of the pier length and pump groundwater from all excavations. Concrete should not be placed in pier excavations with more than three inches of standing water.

Shallow foundations

Alternatively, and at greater risk to the owner of total settlement, the structure may be founded on shallow spread and continuous foundations. However, the native loosely consolidated silty and sandy soils are not considered appropriate for the support of the foundations. The native soils should be overexcavated and replaced with engineered fill as outlined below:

- Subgrade soils should be excavated a minimum of 36 inches below the proposed bottom of foundation
- The excavation of subgrade soils should extend an additional 36 inches from each side of the proposed foundation
- Subgrade soils should be moisture conditioned
- Subgrade soils should be compacted as described in the earthwork section
- Subgrade soils should be tested for compaction
- The excavated subgrade soils should be replaced with conditioned, compacted, and tested engineered fill according to the earthwork section
- Excavation and replacement should be performed in the presence of the geotechnical engineer

The following table provides additional information for the design and construction of the recommended shallow foundations:

Design Parameter	*Design Value*
Allowable bearing capacity (psf)	2,500
Allowable transient bearing capacity (psf)[1]	3,325
Min/Max continuous footing widths (in)	18/48
Min/Max spread footing area (ft^2)	4/36
Est. total settlement (in)	1.5
Est. differential vertical movement (in)[2]	0.5
Frost depth (in)	42
Min. heated interior foundation embedment (in)	12
Overexcavation (in)	36
Replacement material	Engineered fill

1. Describes the allowable increase in the bearing capacity for short-term loads such as wind and seismic.
2. Based on a span length of 100 feet. Thus, if the value is 0.5 inches, then differential movement is 1 inch for a span of 200 feet.

Given the shallow groundwater and loose cohesionless soils at the site, we anticipate that extra soil preparation may be necessary during excavation. The contractor should be prepared for weak, saturated soils at or just below the proposed excavation depths that may be prone to collapsing into the excavation. Shallow foundation excavations may require dewatering and/or temporary shoring to maintain stability.

Additionally, the contractor should be prepared to experience difficulty compacting against the weak, saturated subgrades. If additional stabilization is required, we recommend additional overexcavation and/or reinforcement. For example, the overexcavation may be extended by an additional 12 inches below the planned elevation, filled with pit run gravel or #57 stone drainage aggregate, then followed by the planned engineered fill. Alternatively, geosynthetic fabric such as Solmax Mirafi RS380i may be placed at the bottom of the excavation to provide additional reinforcement. If these conditions are encountered, please contact us to confirm the suitability of the proposed stabilization efforts.

Furthermore, we strongly recommend the installation of a perimeter drain system regardless of the initial soil moisture at the time of exploration. The drain system should include a gravel filter that extends vertically to a termination within slotted or standard casing. Alternatively, a geosynthetic such as Mirafi G100N may be used in place of the vertical gravel drain.

Slab-on-grade

Due to the presence of loosely consolidated and compressible soils at the site, we recommend that the slab-on-grade construction be supported on soil defined above as engineered fill. The table below indicates the required depths of overexcavation and replacement.

Total Overexcavation Depth (in)	18
WYDOT Grade W Thickness (in)	6
Engineered Fill Thickness (in)	12
Vapor Barrier	Vapor Block 10
Mod. of Subgrade Reaction, k (pci)	200

When buildings are constructed with a concrete slab-on-grade as described above, water vapor from beneath the slab may migrate through the slab and into the building. This water vapor can be reduced with the use of a vapor barrier. Vapor transmission can negatively affect floor coverings and lead to increased moisture within a building. When water vapor migrating through the slab would be undesirable,

we recommend the following to reduce, but not stop, water vapor transmission upward through the slab-on-grade.

We recommend constructing a moisture retarder system directly beneath the slab-on-grade that consists of a Vapor retarder membrane sealed at all seams and pipe penetrations and connected to all footings. Vapor retarders shall conform to Class A vapor retarder per ASTM E 1745-97 "Standard Specification for Plastic Water Vapor Retarders used in Contact with Soil or Granular Fill under Concrete Slabs".

Lateral earth pressures

We have provided lateral earth pressure information in the table below.

Engineering Properties	*Silty sand/ sandy silt*	*Gravelly sand*	*Engineered fill*	*WYDOT Grade W Aggregate*
Moist density (pcf)	110	129	130	135
Friction angle (deg.)	33°	36°	30°	35°
Cohesion (psf)	0	0	0	0
Ka	0.29	0.26	0.33	0.27
Ko	0.46	0.41	0.5	0.43
Kp	3.39	3.85	3.0	3.7
	Equivalent Fluid - Unsaturated			
Active (pcf)	32	33	43	37
At Rest (pcf)	50	53	65	58
Passive (pcf)	373	497	390	498
	Equivalent Fluid - Saturated			
Active (pcf)	79	82	88	85
At Rest (pcf)	88	93	101	98
Passive (pcf)	254	350	295	367

The above parameters are not subjected to a factor of safety. We recommend that the structural design professional using these values apply an appropriate factor of safety based on the overall risk of the project and design.

Corrosion resistance

Laboratory testing indicates that the subgrade soils at the site have low chloride content and high sulfates. Therefore, we recommend that a Corrosion Resistance (CR) Rating of CR 1 be used for metal pipes and culverts, and a CR Rating of CR 3 be used for concrete materials. Pipe and culvert materials may be chosen according to the table below.

Type of Pipe Allowed[1]	*CR Rating*						
	CR 0	CR 1	CR 2	CR 3	CR 4	CR 5	CR 6
Corrugated Galvanized Steel	Y	N	N	N	N	N	N
Aluminized Steel, Type 2	Y	Y	Y	Y	Y	N	N
Bituminous Coated Corrugated Galvanized Steel	Y	Y	N	N	N	N	N
Aramid Fiber Bonded Corrugated Steel	Y	Y	Y	Y	Y	Y	Y
Corrugated Aluminum Alloy	Y	Y	Y	Y	Y	Y	N
Polymeric Precoated Galvanized Steel	Y	Y	Y	Y	Y	Y	Y
Polyvinyl Chloride (PVC)	Y	Y	Y	Y	Y	Y	Y
Polyethylene (PE)/High Density Polyethylene (HDPE)	Y	Y	Y	Y	Y	Y	Y
Polypropylene (PP)	Y	Y	Y	Y	Y	Y	Y
Steel Reinforced Polyethylene (SRPE)	Y	Y	Y	Y	Y	Y	Y
Reinforced Concrete, SP0[2]	Y	Y	N	N	N	N	N
Reinforced Concrete, SP1[2]	Y	Y	Y	N	N	N	N
Reinforced Concrete, SP2[2]	Y	Y	Y	Y	Y	N	N
Reinforced Concrete, SP3[2]	Y	Y	Y	Y	Y	Y	Y
Reinforced Concrete, Epoxy Coated	Y	Y	Y	Y	Y	Y	Y

Modified from CDOT Standard Specifications for Road and Bridge Construction, 2023

1. The type of pipe allowed is based on soil corrosion only. The civil or hydrological engineer should be consulted for corrosion from the system water or for abrasion from flowing water and debris.
2. SP# refers to the sulfate exposure class according to ACI 201.2R. Cementitious materials should meet the following requirements: (SP0) ASTM C150 Type I/II or ASTM C1157 Type GU, (SP1) ASTM C150 Type II or ASTM C1157 Type MS, (SP2) ASTM C150 Type V or ASTM C1157 Type HS, (SP3) ASTM C150 Type V plus pozzolan or ASTM C1157 Type HS with pozzolan. See ACI 201.2R for additional information

For cast-in-place concrete structures, the water-soluble sulfate content in soils at the site indicates a severe risk to concrete. Therefore, foundations and other concrete structures in contact with the soil should be constructed using a high sulfate resistance (HS) cement with a maximum water-to-cement ratio of 0.45 and a minimum 28-day compressive strength of 4,500 psi.

Additional details are provided in the table below:

Risk of Sulfate Exposure	*Exposure Class*[1]	*Cement Options*		
Severe	Class S2	ASTM C150 Type V	ASTM C595 IP(HS), IS(HS), IL(HS), IT(HS)	ASTM C1157 HS

1. According to ACI 201.2R-16 Table 6.1.4.1b

Seismic site classification

The seismic site classification has been determined according to ASCE 7-16. We anticipate this information will be used to determine seismic design characteristics according to Section 1613 of the 2021 International Building Code. The subsurface information collected to a depth of approximately 21 feet has been projected to a depth of 100 feet, and we have determined an appropriate seismic site class designation as D.

Pavement section design

Pavement design calculations have been performed based on the AASHTO 1993 design guide. We have estimated low to moderate traffic volumes consistent with non-retail commercial sites.

The subgrade at the site is generally considered loose sands and silts within the pavement locations explored. Dynamic Cone Penetration (DCP) tests indicate an average design CBR value of 7 for these pavement calculations. However, sections of softer subgrade may be present on site. These subgrade soils may require extra preparation when yielding subgrades are encountered. This preparation will likely involve excavating the yielding soil an extra 12 inches below the planned subgrade elevation, placing a geosynthetic, and replacing the excavated soil with properly prepared and compacted aggregate base. We recommend the use of Tencate Mirafi RS380i geosynthetic for this purpose.

The recommended pavement sections are given in the following table:

Paved Area	*ESALs/day*	*Asphalt*	*Aggregate*	*Concrete (option)*
Parking only[1]	<1	4”	6”	5”
Driving lanes[2]	5	4”	8”	6.5”

1. For areas outside of common travel routes and out of truck routes. If no difference, use driveway section.
2. Includes truck routes.

- We recommend the use of PG 64-28 asphalt binder and a hot or warm mix design.
- Materials should conform to WYDOT Standard Specifications for Road and Bridge Construction, 2021 edition.
- Geosynthetics should be placed in accordance with the manufacturer’s recommendations.
- The geotechnical engineer should observe the excavation of the subgrade soils to determine if they conform to those explored and subsequently relied on in this report.
- The geotechnical engineer should observe proof rolls of the subgrade soils and aggregate base materials to determine if yielding conditions exist.

Site drainage

Settlement and heave of soils and subsequently of the structures they support are often directly related to the in-situ soil moisture content. Provisions to keep the soil moisture as low as possible must be considered in the final site and structural design of the project. **The importance of maintaining a low soil moisture content cannot be overemphasized.** Below, we have listed some of the many methods to help limit the infiltration of surface water into the subsoil:

- Place and grade low-permeability soils such that there is a minimum of 5 percent drop for the first 10 feet around any and all structures
- Consider replacing standard landscaping with plants that require little to no additional watering in a process called xeriscaping
- Surface water from the structures and paved areas should be removed in a direct and efficient manner to collection points
- Ensure the building has roof perimeter gutters and downspouts that extend at least 6 feet from the building wall onto positive drainage
- **Under no circumstances should surface water infiltrators be used to control site drainage without extensive collaboration with the geotechnical engineer**

Construction Monitoring

Our experience and that of our profession clearly indicate that the risk of costly design, construction, and maintenance problems can be significantly lowered by retaining the design geotechnical engineering firm of record to review the project plans and specifications and provide geotechnical observation services during construction. Please keep us informed of the design and construction progress of the project, as we are happy to provide additional information as questions or concerns arise. Please contact us to further discuss these services and how they relate to your specific project.

Limitations and Use of This Report

This report presents geotechnical recommendations for the design of the Wind River Tribal Fish and Game Office. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in the design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and based on the exploration, testing, and engineering analyses performed.

We strive to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is expressed or implied. There are risks of earth movement and property damages inherent in building on or with earth materials. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

This report is based on field and other conditions discovered at the time of report preparation. We developed this report with limited subsurface exploration data. We assumed that our subsurface exploration data is representative of the actual subsurface conditions across the site. Considering possible underground variability of soil, rock, stockpiled material, and groundwater, additional costs may be required to complete the project. We recommend that the owner establish a contingency fund to cover such costs. If unexpected conditions are encountered, notify AGS immediately to review these conditions and provide additional and/or modified recommendations, as necessary.

Our services did not include geohazard exploration. Geohazards may exist in the explored area. We can be retained to explore these potential hazards, and the risks associated with them, under a separate cover and at additional cost. In addition, our geotechnical exploration did not include work to determine the existence of possible hazardous materials. If any hazardous materials are encountered during construction officials from the state agency in charge of environmental cleanup should be notified as soon as possible.

This document must not be subject to unauthorized reuse that is, reusing without written authorization of AGS. Such authorization is essential because it requires AGS to evaluate the document's applicability given new circumstances, including changes in the design and amount of time since the exploration and analyses were performed. Actual field or other conditions will necessitate clarifications, adjustments, modifications or other changes to the documents. Therefore, we must be engaged to prepare the necessary clarifications, adjustments, modifications, or other changes before construction activities commence or further activity proceeds.

If AGS's scope of services does not include on-site construction observation, or if other persons or entities are retained to provide such services, we cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims

arising from or resulting from clarifications, adjustments, modifications, discrepancies, or other changes necessary to reflect changed field or other conditions.

We determined the lines designating the interface between layers on the exploration logs using visual observations. The transition between the materials may be abrupt or gradual. The exploration logs contain information concerning samples recovered, indications of the presence of various materials such as clay, sand, silt, rock, existing fill, etc., and observations of groundwater encountered. The field logs also contain our interpretation of the subsurface conditions between sample locations. Therefore, the logs contain both factual and interpretative information. Our recommendations are based on the contents of the final logs, which represent our interpretation of the field logs.

Closure

We appreciate the opportunity to provide this geotechnical engineering report for your important project. Please give us a call at 307-439-5439 should any questions or concerns arise.

Regards,

Hayden Dierker, E.I.T.
Geotechnical Engineer

Reviewed by:

Shantel Ramlo, P.E.
Geotechnical Engineer
Vice President

Appendix A

Project Id:	25116	Title:	Site Location Map
Project Title:	Wind River Fish and Game Office	Scale:	1:8000
Location:	Fort Washakie, Wyoming	Engineer:	
Client:	WInd River Development Fund	Contractor:	

AdvancedGeotechnical Solutions

Legend Key

Project Bounds - Project Bounds

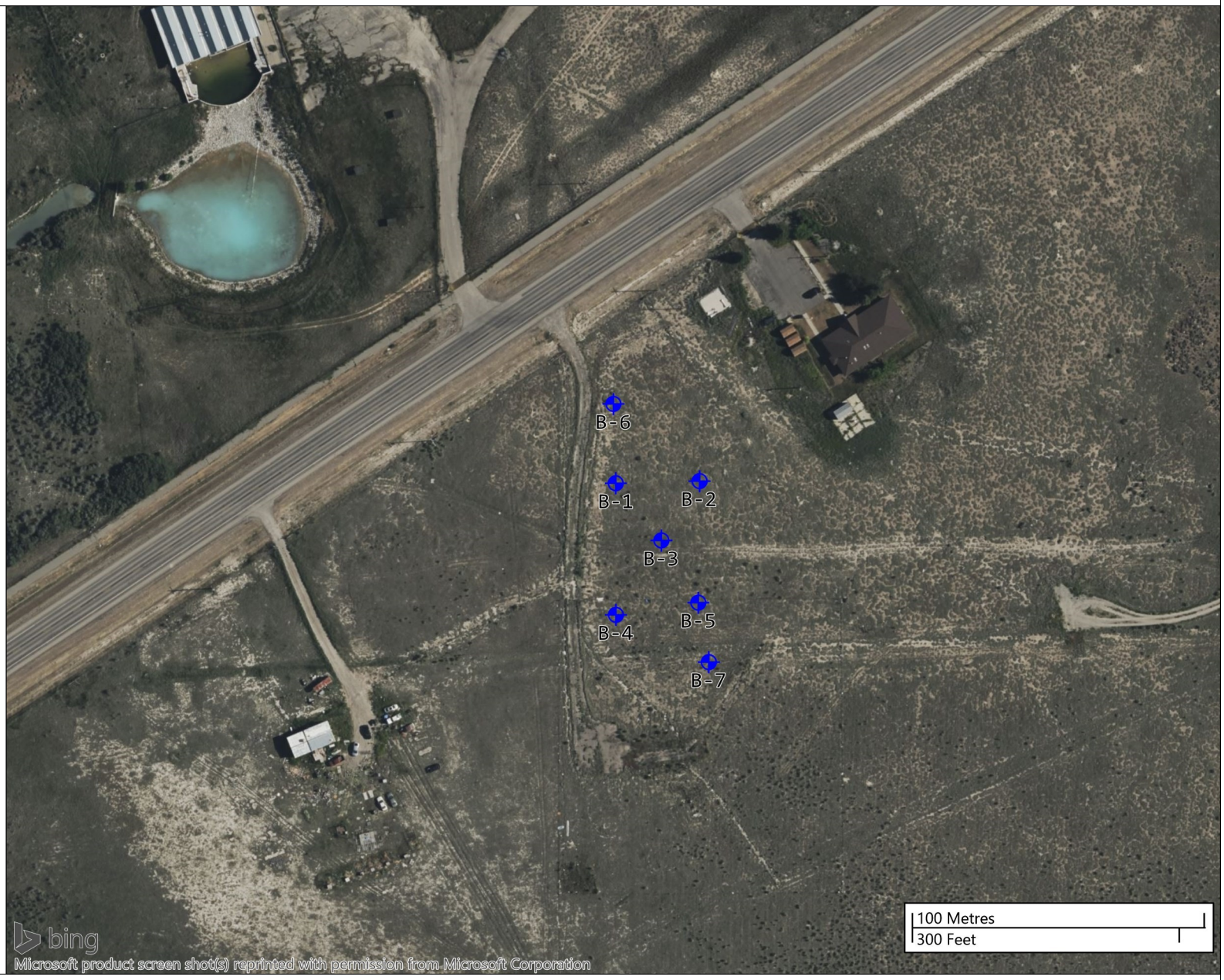


Project Id:	25116	Title:	Boring Location Map
Project Title:	Wind River Fish and Game Office	Scale:	1:2000
Location:	Fort Washakie, Wyoming	Engineer:	
Client:	WInd River Development Fund	Contractor:	

AdvancedGeotechnical Solutions

Legend Key

Locations By Type - BH



AdvancedGeotechnical Solutions

Borehole ID: B-1

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 05 2026 **Completed:** Feb 05 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00716 **Longitude:** -108.83379 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling 8.00 on Feb 05 2026
Hammer Type: Automatic hammer
Notes:

Depth	Elevation	Graphic	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0		Soft, dry, light reddish tan, silt			SPT-B-1-1	87	4					
2	-2.0		Medium stiff to soft, dry to wet, light tan, sandy silt										
3	-3.0					SPT-B-1-2	73	7					
4	-4.0												
5	-5.0					SPT-B-1-3	100	4					
6	-6.0												
7	-7.0												
8	-8.0					SPT-B-1-4	93	2					
9	-9.0												
10	-10.0		Very loose, wet, light brownish tan, silty sand										
11	-11.0					SPT-B-1-5	33	2	0	0	0	32	
12	-12.0												
13	-13.0												
14	-14.0		Dense to very dense, wet, dark bluish gray, silty, gravelly sand										
15	-15.0												
16	-16.0					SPT-B-1-6	87	45	0	0	0	17	
17	-17.0												
18	-18.0												
19	-19.0												
20	-20.0												
21	-21.0					SPT-B-1-7	115	50/4"					

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Borehole ID: B-2

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 05 2026 **Completed:** Feb 05 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00716 **Longitude:** -108.83344 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling 7.00 on Feb 05 2026
Hammer Type: Automatic hammer
Notes:

Depth	Elevation	Graphic	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0		Soft, dry, light reddish tan, silt			SPT-B-2-1	107	4					
2	-2.0		Medium stiff, dry, light tan, sandy silt										
3	-3.0					SPT-B-2-2	93	4	0	0	0	61	
4	-4.0					AU-B-2-2a							
5	-5.0												
6	-6.0					SPT-B-2-3	87	6					
7	-7.0		Very loose, wet, light whitish tan, silty sand										
8	-8.0					SPT-B-2-4	100	4					
9	-9.0												
10	-10.0												
11	-11.0					SPT-B-2-5	120	4					
12	-12.0												
13	-13.0												
14	-14.0												
15	-15.0		Dense, wet, dark bluish gray, silty, gravelly sand										
16	-16.0					SPT-B-2-6	87	36					

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Borehole ID: B-3

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 05 2026 **Completed:** Feb 05 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00698 **Longitude:** -108.83360 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling 8.00 on Feb 05 2026
Hammer Type: Automatic hammer
Notes:

Depth	Elevation	Graphic	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0		Medium stiff, dry, light reddish tan, silt			SPT-B-3-1	87	5					
2	-2.0												
3	-3.0		Loose to very loose, dry to wet, light tan, silty sand			SPT-B-3-2	93	6					
4	-4.0												
5	-5.0					SPT-B-3-3	107	6					
6	-6.0												
7	-7.0												
8	-8.0					SPT-B-3-4	100	4					
9	-9.0												
10	-10.0												
11	-11.0					SPT-B-3-5	73	2	0	0	0	31	
12	-12.0												
13	-13.0												
14	-14.0												
15	-15.0		Dense, wet, dark bluish gray, silty gravelly sand										
16	-16.0					SPT-B-3-6	107	20					

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Borehole ID: B-4

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 05 2026 **Completed:** Feb 05 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00675 **Longitude:** -108.83379 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling 8.00 on Feb 05 2026
Hammer Type: Automatic hammer
Notes:

Depth	Elevation	Graphic	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0		Soft, dry, light reddish tan, silt			SPT-B-4-1	80	4					
2	-2.0		Loose to very loose, moist to wet, light tan, silty sand										
3	-3.0					SPT-B-4-2	93	6					
4	-4.0												
5	-5.0					SPT-B-4-3	87	5					
6	-6.0												
7	-7.0												
8	-8.0					SPT-B-4-4	100	5					
9	-9.0												
10	-10.0												
11	-11.0					SPT-B-4-5	107	2					
12	-12.0		Loose to dense, wet, dark bluish gray, silty, gravelly sand										
13	-13.0					SS-B-4-6	0	9					
14	-14.0												
15	-15.0												
16	-16.0					SPT-B-4-7	67	37	0	0	0	10	

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Borehole ID: B-5

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 06 2026 **Completed:** Feb 06 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00679 **Longitude:** -108.83344 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling 8.00 on Feb 06 2026
Hammer Type: Automatic hammer
Notes:

Depth	Elevation	Graphic	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0		Soft, dry, light reddish tan, silt			SPT-B-5-1	80	2					
2	-2.0		Medium stiff, moist, light tan, sandy silt										
3	-3.0					SPT-B-5-2	80	6					
4	-4.0												
5	-5.0												
6	-6.0					SPT-B-5-3	107	5					
7	-7.0												
8	-8.0		Loose to very loose, wet, light tan, silty sand			SPT-B-5-4	100	6					
9	-9.0												
10	-10.0												
11	-11.0					SPT-B-5-5	93	3	0	0	0	40	
12	-12.0												
13	-13.0												
14	-14.0		Dense, wet, dark bluish gray, silty, gravelly sand										
15	-15.0												
16	-16.0					SPT-B-5-6	100	36					

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Borehole ID: B-6

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 05 2026 **Completed:** Feb 05 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00740 **Longitude:** -108.83380 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling 8.00 on Feb 05 2026
Hammer Type: Automatic hammer
After drilling 13.00 on Feb 05 2026
Notes:

Depth	Elevation	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0	Medium stiff, dry, light reddish tan, silt			SPT-B-6-1	120	6					
2	-2.0											
3	-3.0	Medium stiff to soft, dry to wet, light tan, sandy silt			SPT-B-6-2	100	5	0	0	0	60	
4	-4.0											
5	-5.0											
6	-6.0				SPT-B-6-3	107	4					
7	-7.0				AU-B-6-3a							
8	-8.0				SPT-B-6-4	87	2					
9	-9.0											
10	-10.0											
11	-11.0				SPT-B-6-5	93	3					
12	-12.0											
13	-13.0											
14	-14.0	Dense, wet, dark bluish gray, silty, gravelly sand										
15	-15.0											
16	-16.0				SPT-B-6-6	100	31					

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Borehole ID: B-7

Sheet 1 of 1

Client: WInd River Development Fund
Project Name: Wind River Fish and Game Office
Project Number: 25116
Project Location: Fort Washakie, Wyoming
Date Started: Feb 06 2026 **Completed:** Feb 06 2026
Logged By: James Lichtenberg **Drilled By:** Dale Henderson
Drilling Contractor: Henderson Drilling Inc.
Latitude: 43.00660 **Longitude:** -108.83340 **Elevation:**
Drilling Method: 3-1/4" Hollow stem auger
Ground Water Levels
Equipment:
At time of drilling: Feb 06 2026 - not encountered
Hammer Type: Automatic hammer
Notes:

Depth	Elevation	Graphic	Material Description	SPT Samples	Other Samples	Number	Recovery % RQD	N Value	ATTERBERG LIMITS (%) LL	PL	PI	PERCENT FINES (%)	Dry Unit Wt. (pcf)
1	-1.0		Stiff, dry, light reddish tan, silt			SPT-B-7-1	67	10	43	38	5	71	
2	-2.0		Medium stiff, dry, light tan, sandy silt										
3	-3.0					SPT-B-7-2	933	6					
4	-4.0												
5	-5.0												
6	-6.0					SPT-B-7-3	80	5					

SPT N-Value
MC
SPT
10 20 30 40 50 60 70 80 90
5 10 15 20 25 30 35 40 45
MC

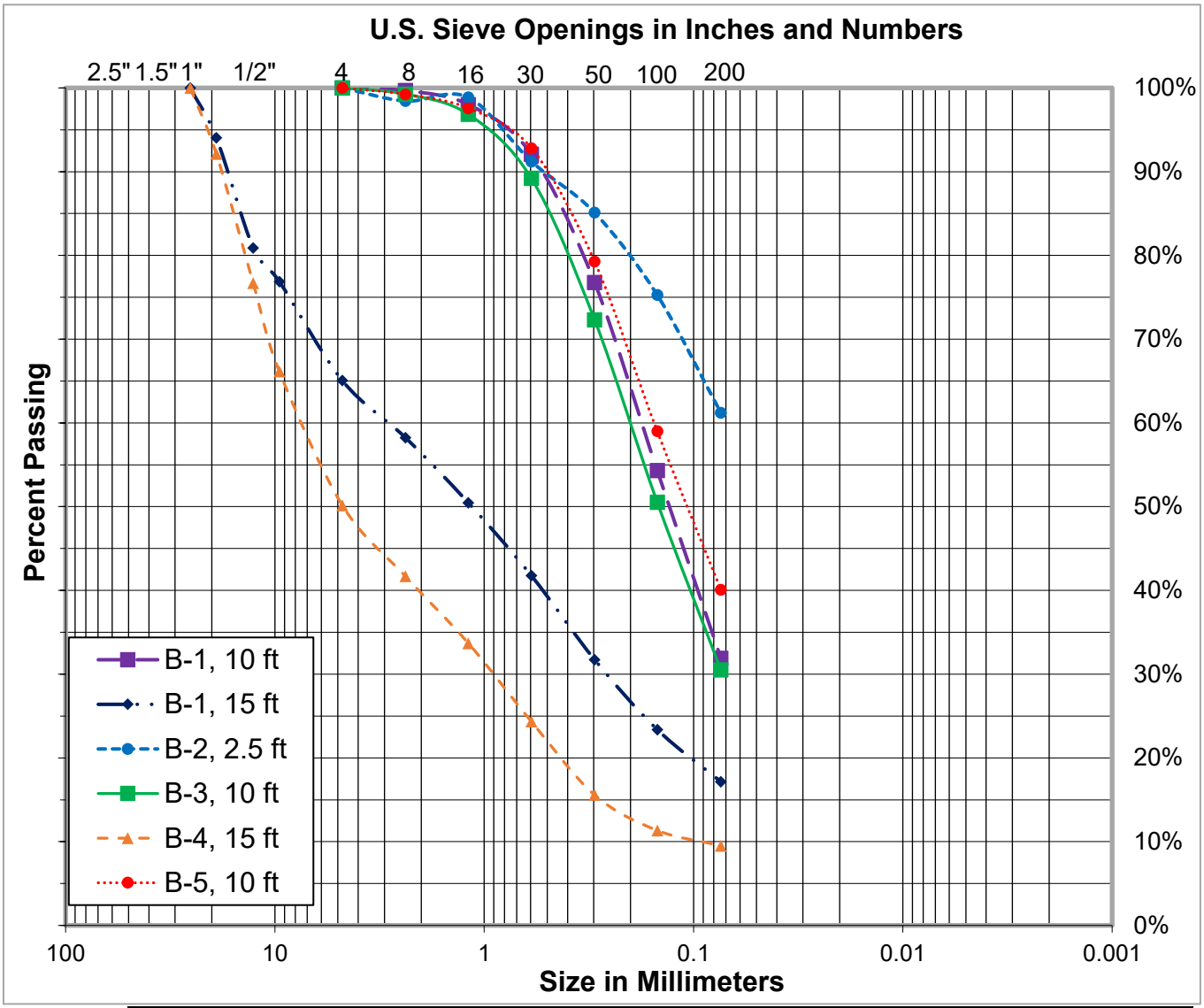
SAMPLE TYPES:

Auger Cuttings | Standard Penetration | Modified California | Undisturbed Sample | Shelby Tube | Drive Sample 2.5" | Rock Core

AdvancedGeotechnical Solutions

Particle Size Analyses

Project #	25116	**Client**	Wind River Development Fund		
Project	Wind River Fish and Game Office	**Tested By**	LS, HD	**Test Date**	2/9/2026



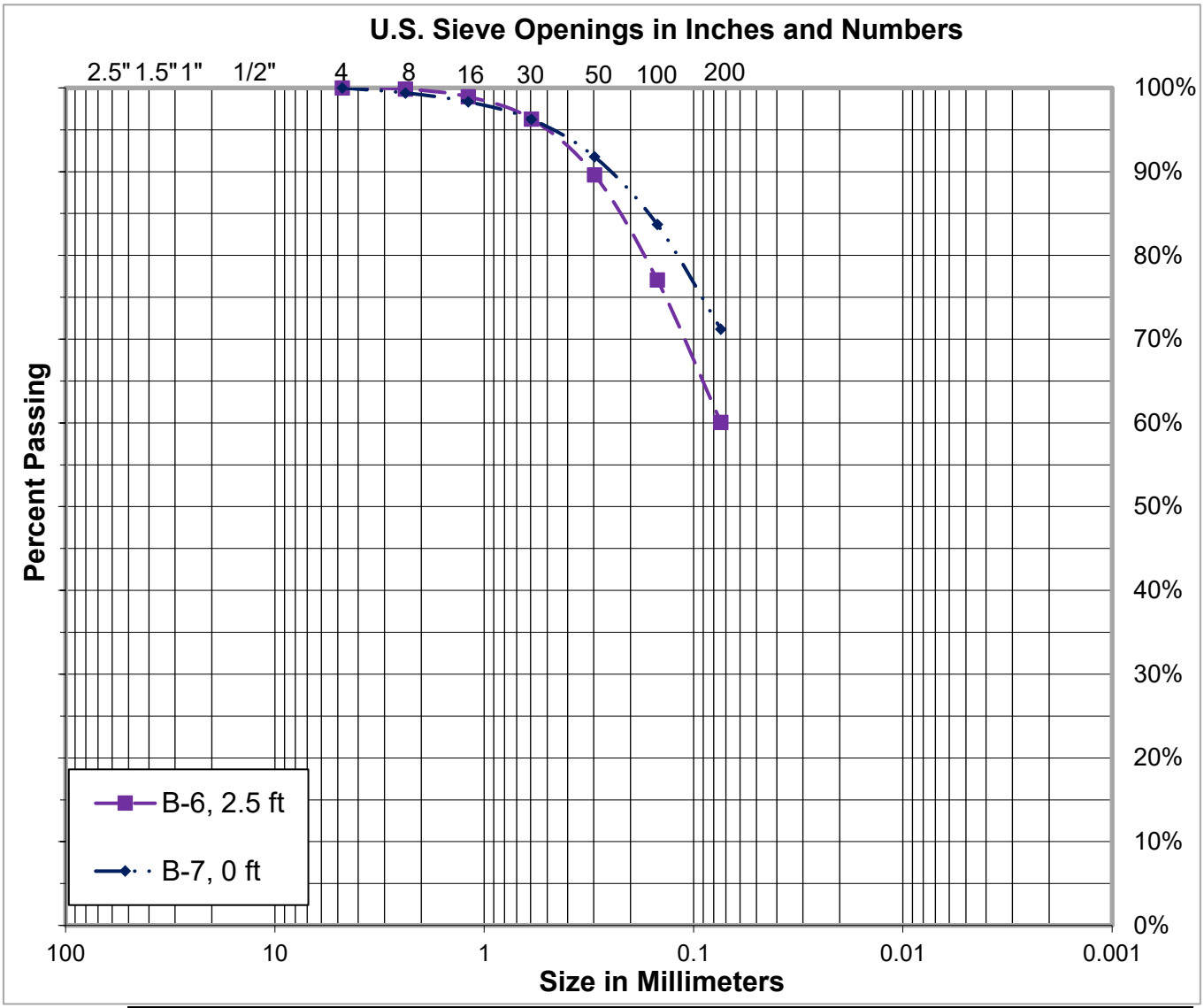
Boring	B-1	B-1	B-2	B-3	B-4	B-5
Depth (ft)	10	15	2.5	10	15	10

U.S. Standard Sieve Size Percent Passing

1.5"						
1"		100.0%			100.0%	
3/4"		94.0%			92.1%	
1/2"		80.9%			76.7%	
3/8"		76.9%			66.1%	
#4	100.0%	65.1%	100.0%	100.0%	50.1%	100.0%
#8	99.7%	58.2%	98.4%	99.3%	41.7%	99.2%
#16	98.0%	50.4%	98.9%	96.8%	33.7%	97.6%
#30	92.1%	41.8%	91.2%	89.2%	24.3%	92.8%
#50	76.8%	31.7%	85.1%	72.3%	15.6%	79.3%
#100	54.3%	23.4%	75.3%	50.5%	11.3%	59.0%
#200	31.9%	17.2%	61.2%	30.5%	9.5%	40.1%

Particle Size Analyses

Project #	25116	**Client**	Wind River Development Fund		
Project	Wind River Fish and Game Office	**Tested By**	LS, HD	**Test Date**	2/9/2026



Boring	B-6	B-7				
Depth (ft)	2.5	0				

U.S. Standard Sieve Size Percent Passing

1.5"						
1"						
3/4"						
1/2"						
3/8"						
#4	100.0%	100.0%				
#8	99.9%	99.4%				
#16	98.9%	98.3%				
#30	96.3%	96.2%				
#50	89.6%	91.8%				
#100	77.1%	83.7%				
#200	60.1%	71.2%				

AdvancedGeotechnical Solutions

DIRECT SHEAR

STANDARDS: ASTM D3080

Project #:	25116	**Client:**	Wind River Development Fund		
Project:	Wind River Fish and Game Office	**Tested By:**	HD	**Test Date:**	2/16/2026

SAMPLE INFORMATION

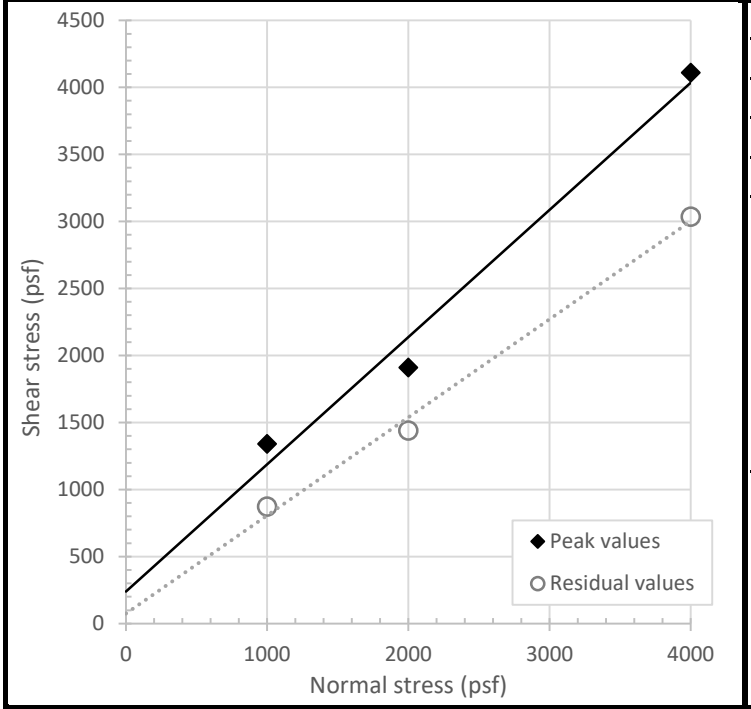
Sample #	B-1-7&B-5-6	**Strain rate (in/min)**	0.007
Depth	15-20	**Displacement to residual strength (in)**	0.3
Material	Gray silty gravelly sand/sandy gravel	**Estimated specific gravity**	2.7
Sample type	Remolded to in-situ density	**Notes:**	

PEAK STRENGTH

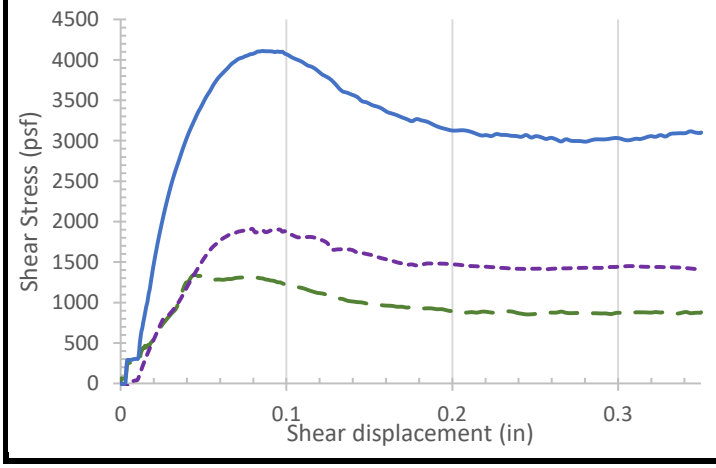
Friction angle, ϕ (deg.)	43.5
Apparent cohesion, c (psf)	240

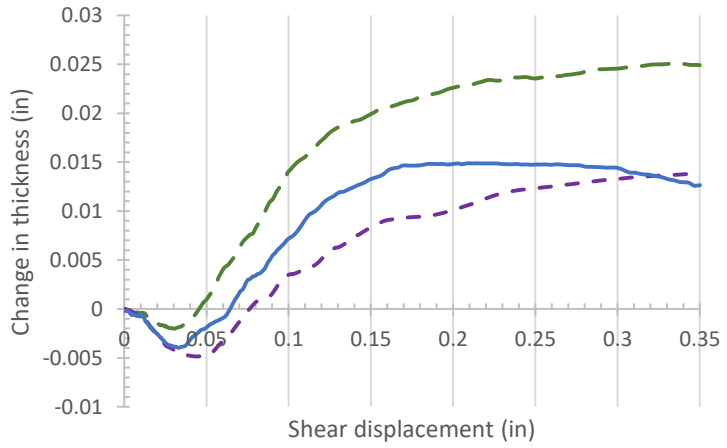
RESIDUAL STRENGTH

Friction angle, ϕ (deg.)	36.2
Apparent cohesion, c (psf)	75



	Point	1	2	3
	Normal stress (psf)	1000	2000	4000
	Peak shear stress (psf)	1340	1910	4110
	Residual shear stress (psf)	873	1440	3035
Initial	Sample diameter (in)	2.50	2.50	2.50
Initial	Sample height (in)	1.000	1.000	1.000
Initial	Moisture content (%)	15.0%	15.0%	15.0%
Initial	Dry density (pcf)	112.4	112.4	112.4
Initial	Moist density (pcf)	129.2	129.2	129.2
Initial	Void ratio	0.500	0.500	0.500
Initial	Saturation (%)	81%	81%	81%
Pre-shear	Sample height (in)	0.958	0.926	0.955
Pre-shear	Moisture content (%)	15.2%	13.9%	17.2%
Pre-shear	Dry density (pcf)	117.3	121.4	117.7
Pre-shear	Moist density (pcf)	135.1	138.3	137.9
Pre-shear	Void ratio	0.437	0.389	0.433
Pre-shear	Saturation (%)	94%	97%	100%





Data smoothed to reduce noise. Sample screened over No.4 sieve to remove oversize particles.

Report #: 25116_B-1-7&B-5-6_Shear
Date issued: 2/26/2026

Issued by:

Advanced Geotechnical Solutions, Inc.
3440 Bypass Blvd Casper, WY 82601
(307) 439-5439

Results relate only to the items tested. Report shall not be reproduced, except in full, without prior written approval of AGS.

AdvancedGeotechnical Solutions

DIRECT SHEAR

STANDARDS: ASTM D3080

Project #:	25116	**Client:**	Wind River Development Fund		
Project:	Wind River Fish and Game Office	**Tested By:**	LS	**Test Date:**	2/10/2026

SAMPLE INFORMATION

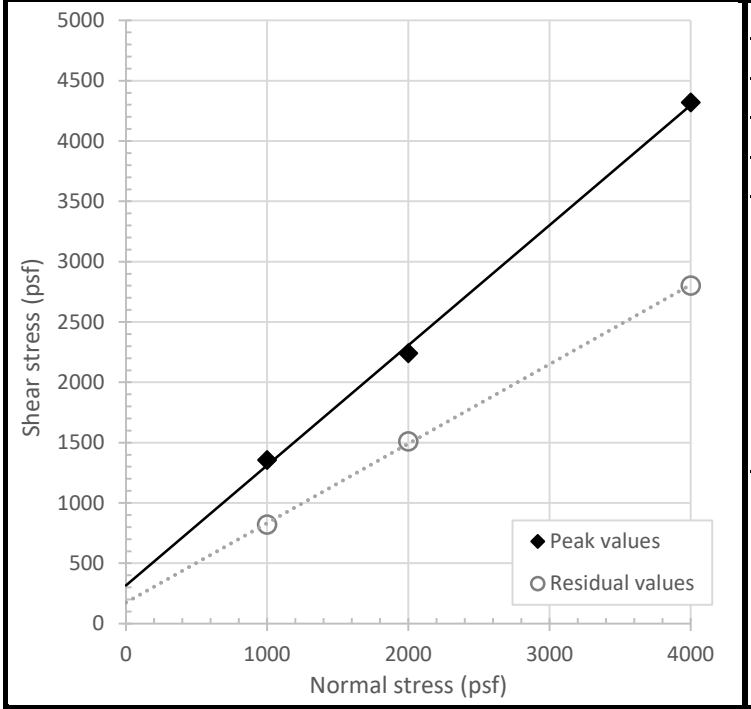
Sample #	B-3-2&B-3-3	**Strain rate (in/min)**	0.001
Depth	2.5	**Displacement to residual strength (in)**	0.3
Material	Light Tan Silty Sand	**Estimated specific gravity**	2.7
Sample type	Remolded to in-situ density	**Notes:**	

PEAK STRENGTH

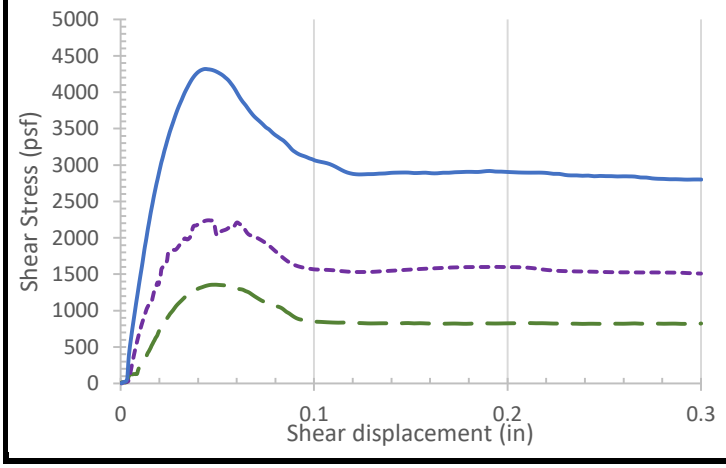
Friction angle, ϕ (deg.)	44.9
Apparent cohesion, c (psf)	316

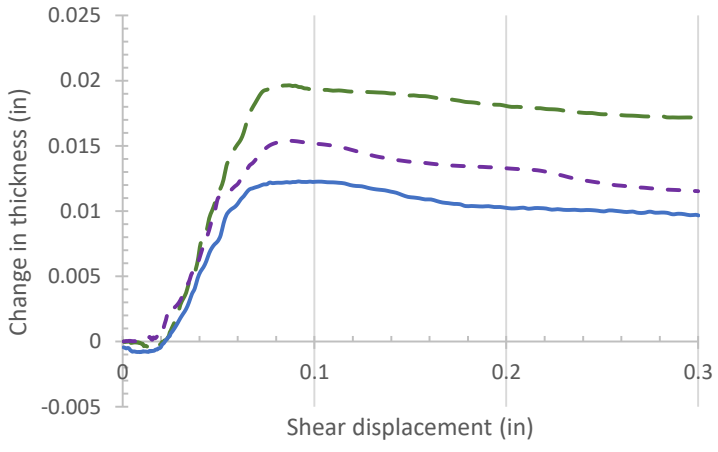
RESIDUAL STRENGTH

Friction angle, ϕ (deg.)	33.4
Apparent cohesion, c (psf)	175



	Point	1	2	3
	Normal stress (psf)	1000	2000	4000
	Peak shear stress (psf)	1356	2241	4319
	Residual shear stress (psf)	820	1510	2802
Initial	Sample diameter (in)	2.50	2.50	2.50
Initial	Sample height (in)	0.997	0.994	0.998
Initial	Moisture content (%)	22.6%	22.6%	22.6%
Initial	Dry density (pcf)	90.0	90.3	90.0
Initial	Moist density (pcf)	110.4	110.7	110.3
Initial	Void ratio	0.872	0.867	0.874
Initial	Saturation (%)	70%	70%	70%
Pre-shear	Sample height (in)	0.980	0.971	0.962
Pre-shear	Moisture content (%)	29.2%	29.4%	29.0%
Pre-shear	Dry density (pcf)	91.6	92.4	93.4
Pre-shear	Moist density (pcf)	118.3	119.6	120.4
Pre-shear	Void ratio	0.841	0.824	0.806
Pre-shear	Saturation (%)	94%	96%	97%





Data smoothed to reduce noise. Sample screened over No.4 sieve to remove oversize particles.

Report #: 25116_B-3-2&B-3-3_Shear
Date issued: 2/26/2026

Issued by:

Advanced Geotechnical Solutions, Inc.
3440 Bypass Blvd Casper, WY 82601
(307) 439-5439

Results relate only to the items tested. Report shall not be reproduced, except in full, without prior written approval of AGS.

DYNAMIC CONE PENETRATION (DCP)

STANDARDS: ASTM D6951*

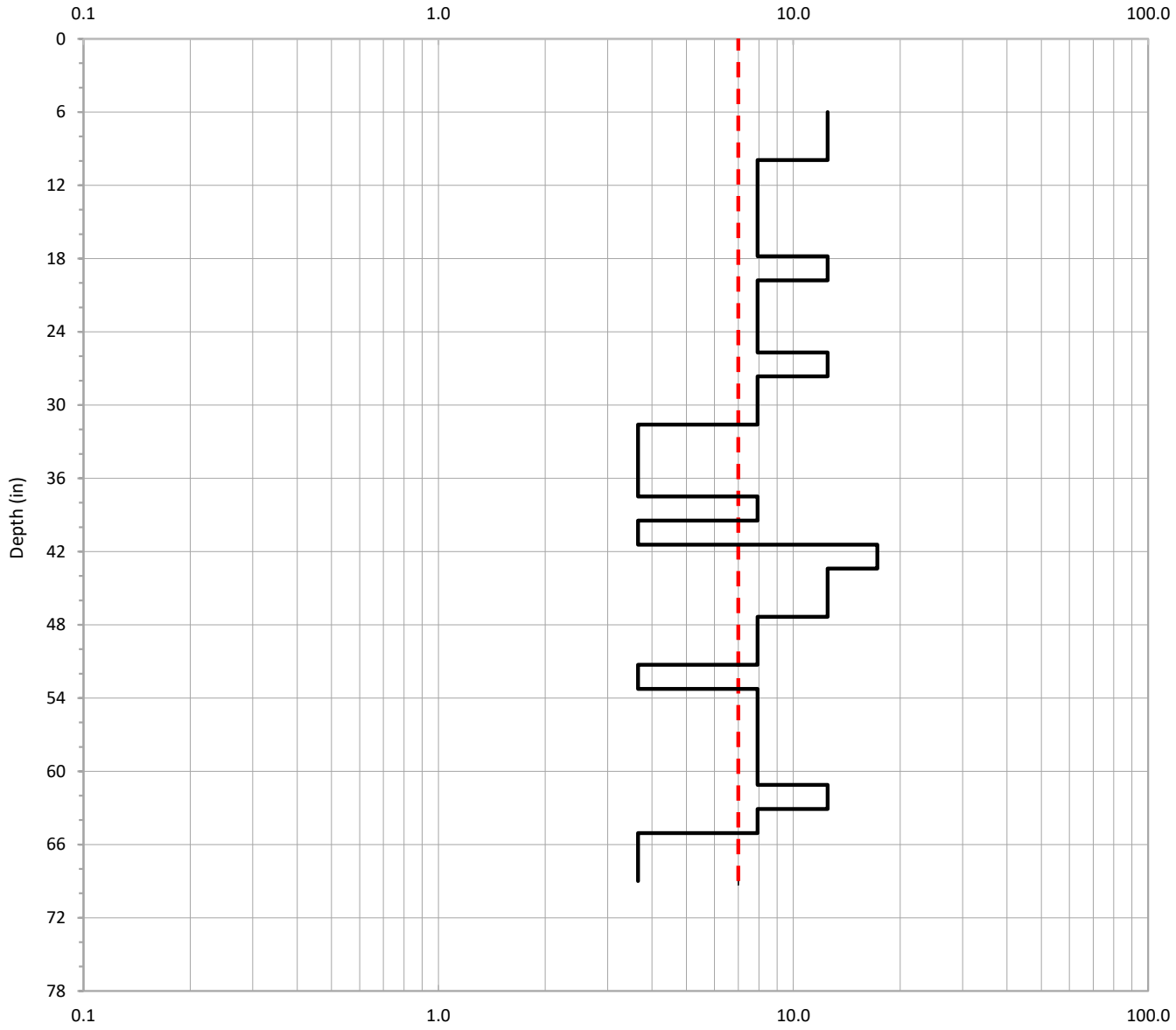
Project #:	25116	**Client:**	Wind River Development Fund		
Project:	Wid River Fish & Game Office	**Tested By:**	JL	**Test Date:**	2/6/2026

TEST INFORMATION

Location name	B-2	**Depth below ground surface (in)**	6.0
GPS coordinates	43.00660, -108.83340	**Notes:**	
Asphalt thickness (in)	N/A		
Base thickness (in)	N/A		

CORRELATED CALIFORNIA BEARING RATIO (CBR)

Minimum CBR	**3.7**	**Weighted average CBR**	**7**



Average CBR is a weighted average with an emphasis on soil layers with lower measured CBRs and soil layers closer to the pavement section.

*modified from ASTM D6951 with data tables not included in this report. CBR calculated according to CBR=292/DCP^1.12 Hammer weight = 10.1 lbs

Report #:	25116_B-2_DCP	**Issued by:**	Advanced Geotechnical Solutions, Inc.
Date issued:	3/4/2026		3440 Bypass Blvd Casper, WY 82601
			(307) 439-5439

Results relate only to the items tested. Report shall not be reproduced, except in full, without prior written approval of AGS.

DYNAMIC CONE PENETRATION (DCP)

STANDARDS: ASTM D6951*

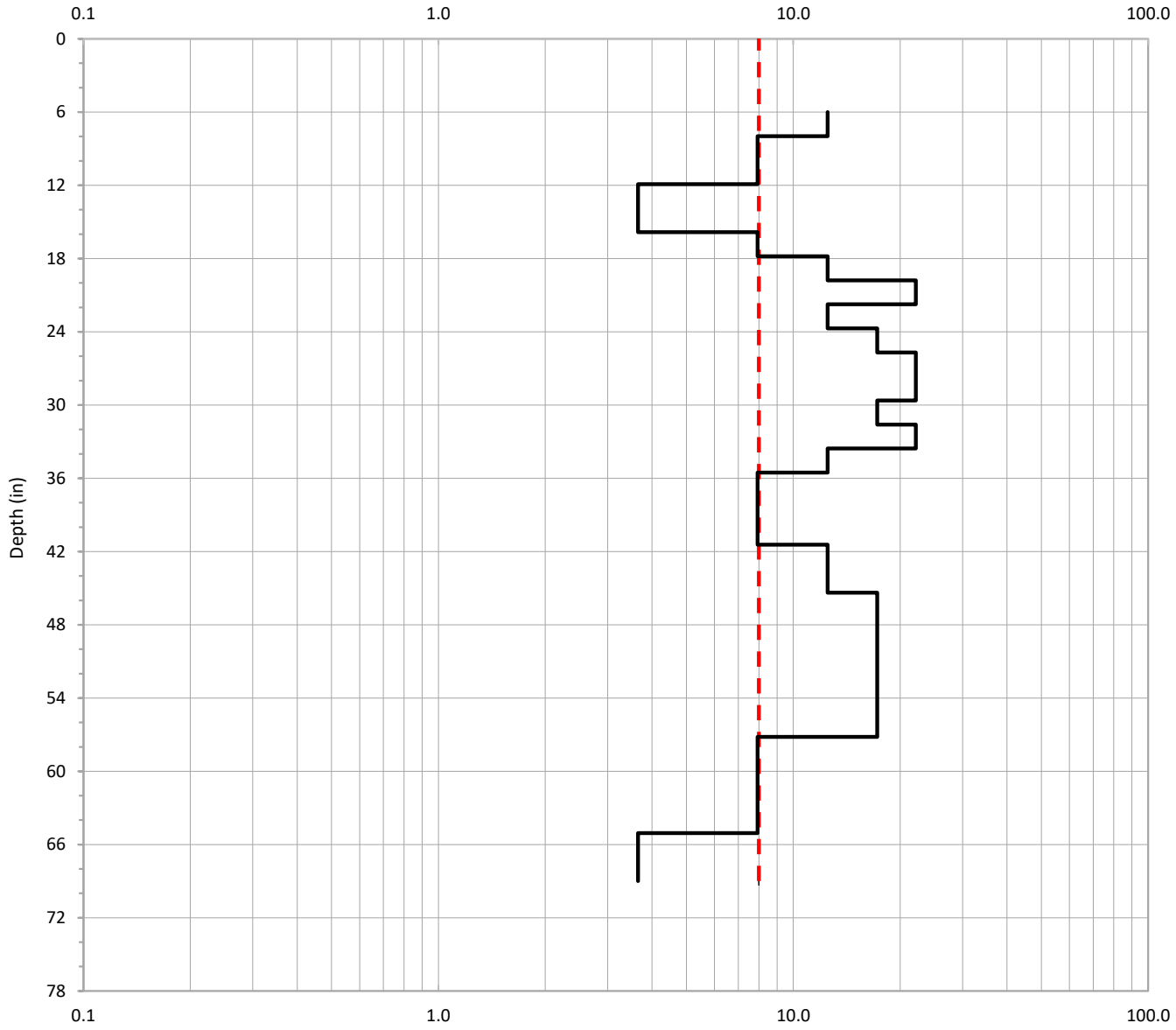
Project #:	25116	**Client:**	Wind River Development Fund		
Project:	Wid River Fish & Game Office	**Tested By:**	JL	**Test Date:**	2/5/2026

TEST INFORMATION

Location name	B-6	**Depth below ground surface (in)**	6.0
GPS coordinates	43.00740, -108.83380	**Notes:**	
Asphalt thickness (in)	N/A		
Base thickness (in)	N/A		

CORRELATED CALIFORNIA BEARING RATIO (CBR)

Minimum CBR	**3.7**	**Weighted average CBR**	**8**



Average CBR is a weighted average with an emphasis on soil layers with lower measured CBRs and soil layers closer to the pavement section.

*modified from ASTM D6951 with data tables not included in this report. CBR calculated according to CBR=292/DCP^1.12 Hammer weight = 10.1 lbs

Report #:	25116_B-6_DCP	**Issued by:**	Advanced Geotechnical Solutions, Inc.
Date issued:	3/4/2026		3440 Bypass Blvd Casper, WY 82601
			(307) 439-5439

Results relate only to the items tested. Report shall not be reproduced, except in full, without prior written approval of AGS.

ANALYTICAL SUMMARY REPORT

February 24, 2026

Advanced Geotechnical Solutions
3440 Bypass Blvd
Casper, WY 82601

Work Order: C26020333 Quote ID: C18749

Project Name: 25116 Wind River Fish And Game Office

Energy Laboratories, Inc. Casper WY received the following 3 samples for Advanced Geotechnical Solutions on 2/10/2026 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C26020333-001	B-2-4 7.5 Feet	02/06/26 00:00	02/10/26	Solid	Anions, Water Extractable pH, 1:X Water Extractable DI Water Soil Extract ASA10-3
C26020333-002	B-4-3 5 Feet	02/06/26 00:00	02/10/26	Solid	Same As Above
C26020333-003	B-6-3 5 Feet	02/06/26 00:00	02/10/26	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 2393 Salt Creek Hwy, Casper, WY 82601-9601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

Energy Laboratories, Inc. verifies the reported results for the analysis has been technically reviewed and approved for release.

If you have any questions regarding these test results, please contact your Project Manager.

CLIENT: Advanced Geotechnical Solutions
Project: 25116 Wind River Fish And Game Office
Work Order: C26020333

Report Date: 02/24/26

CASE NARRATIVE

Tests associated with analyst identified as ELI-H were subcontracted to Energy Laboratories, 3161 E.Lyndale Ave., Helena, MT, EPA Number MT00945.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Advanced Geotechnical Solutions
Project: 25116 Wind River Fish And Game Office
Lab ID: C26020333-001
Client Sample ID: B-2-4 7.5 Feet

Report Date: 02/24/26
Collection Date: 02/06/26
DateReceived: 02/10/26
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
1:X SOIL:WATER							
pH, 1:2	8.2	s.u.		0.1		ASA10-3	02/20/26 13:57 / eli-h
1:X SOIL:WATER							
Chloride, 1:2	57	mg/kg-dry		1		E300.0	02/19/26 01:15 / eli-h
Sulfate, 1:2	349	mg/kg-dry		1		E300.0	02/19/26 01:15 / eli-h

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Advanced Geotechnical Solutions
Project: 25116 Wind River Fish And Game Office
Lab ID: C26020333-002
Client Sample ID: B-4-3 5 Feet

Report Date: 02/24/26
Collection Date: 02/06/26
DateReceived: 02/10/26
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
1:X SOIL:WATER							
pH, 1:2	8.7	s.u.		0.1		ASA10-3	02/20/26 13:58 / eli-h
1:X SOIL:WATER							
Chloride, 1:2	295	mg/kg-dry		1		E300.0	02/19/26 02:12 / eli-h
Sulfate, 1:2	1810	mg/kg-dry		1		E300.0	02/19/26 02:12 / eli-h

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Advanced Geotechnical Solutions
Project: 25116 Wind River Fish And Game Office
Lab ID: C26020333-003
Client Sample ID: B-6-3 5 Feet

Report Date: 02/24/26
Collection Date: 02/06/26
DateReceived: 02/10/26
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
1:X SOIL:WATER							
pH, 1:2	7.8	s.u.		0.1		ASA10-3	02/20/26 13:59 / eli-h
1:X SOIL:WATER							
Chloride, 1:2	332	mg/kg-dry		1		E300.0	02/19/26 03:10 / eli-h
Sulfate, 1:2	4000	mg/kg-dry		1		E300.0	02/19/26 03:10 / eli-h

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Work Order: C26020333 **Report Date:** 02/24/26

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA10-3**										al Run: SOIL PH METER - ORION A211_260220A
Lab ID: **ICV_1_260220_1**		Initial Calibration Verification Standard								02/20/26 13:49
pH, 1:2		7.01	s.u.	0.10	100	98.6	101.4			
Lab ID: **CCV_1_260220_1**		Continuing Calibration Verification Standard								02/20/26 13:51
pH, 1:2		7.02	s.u.	0.10	100	98.6	101.4			
Lab ID: **CCV1_1_260220_1**		Continuing Calibration Verification Standard								02/20/26 13:53
pH, 1:2		3.99	s.u.	0.10	100	97.5	102.5			
Method: **ASA10-3**										Batch: 82552
Lab ID: **LCS-82552**		Laboratory Control Sample				Run: SOIL PH METER - ORION A2				02/20/26 13:56
pH, 1:2		7.53	s.u.	0.10	95	95	105			
Lab ID: **C26020333-003ADUP**		Sample Duplicate				Run: SOIL PH METER - ORION A2				02/20/26 14:01
pH, 1:2		7.60	s.u.	0.10				3.2	20	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Work Order: C26020333 **Report Date:** 02/24/26

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0									Analytical Run: IC METROHM_260218A	
Lab ID: ICV	2	Initial Calibration Verification Standard								02/18/26 09:34
Chloride		102	mg/L	1.0	102	90	110			
Sulfate		406	mg/L	1.0	102	90	110			
Lab ID: CCV	2	Continuing Calibration Verification Standard								02/18/26 10:17
Chloride		51.6	mg/L	1.0	103	90	110			
Sulfate		208	mg/L	1.0	104	90	110			
Lab ID: CCV	2	Continuing Calibration Verification Standard								02/19/26 03:38
Chloride		52.7	mg/L	1.0	105	90	110			
Sulfate		213	mg/L	1.0	107	90	110			
Method: E300.0									Batch: 82513	
Lab ID: MB-82513	2	Method Blank				Run: IC METROHM_260218A				02/19/26 00:03
Chloride, 1:2		0.3	mg/kg-dry	0.008						
Sulfate, 1:2		0.1	mg/kg-dry	0.08						
Lab ID: LCS-82513	2	Laboratory Control Sample				Run: IC METROHM_260218A				02/19/26 00:17
Chloride, 1:2		128	mg/kg-dry	1.0	114	70	130			
Sulfate, 1:2		1880	mg/kg-dry	1.0	106	70	130			
Lab ID: C26020333-001ADUP	2	Sample Duplicate				Run: IC METROHM_260218A				02/19/26 01:29
Chloride, 1:2		66.7	mg/kg-dry	1.0				15	20	
Sulfate, 1:2		348	mg/kg-dry	1.0				0.5	20	
Lab ID: H26020475-001ADUP	2	Sample Duplicate				Run: IC METROHM_260218A				02/19/26 02:41
Chloride, 1:2		4.04	mg/kg-dry	1.0				0.7	20	
Sulfate, 1:2		16.5	mg/kg-dry	1.0				0.0	20	
Lab ID: C26020333-003AMS	2	Sample Matrix Spike				Run: IC METROHM_260218A				02/19/26 03:24
Chloride, 1:2		851	mg/kg-dry	1.0	104	90	110			
Sulfate, 1:2		6070	mg/kg-dry	1.1	103	90	110			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



10 YEARS

Integrity • Excellence
Exceptional Service • Professional Growth

AdvancedGeotechnical
Solutions

3440 Bypass Blvd. Casper, Wyoming 82601

October 16, 2026

Leslie Shakespeare
Wind River Development Fund
3 Ethete Road
Fort Washakie, WY 82514

Mr. Shakespeare,

The purpose of this addendum is to provide Engineered Aggregate Pier (EAP) recommendations for the Wind River Tribal Fish and Game Office. We understand that EAPs are being considered to reinforce the highly compressible soils at the site, with the goal of reducing overall settlement under shallow foundations.

Shallow foundations with Engineered Aggregate Piers (EAPs)

The proposed structure may be supported by shallow spread and continuous footings in combination with EAPs. EAPs are constructed by compacting aggregate into predrilled holes to form stone columns, typically on a grid system. The piers provide additional vertical support, densify surrounding soils, and help to decrease settlement.

Footings may bear directly on the EAP-reinforced native soils, without any additional overexcavation and replacement required. All other subgrade soil preparation should be performed as outlined in the original geotechnical engineering report.

EAPs should be designed and installed by a qualified specialty contractor to meet the minimum performance requirements described in the table below:

Design Parameter	*Design Value*
Allowable bearing capacity (psf)	2,500
Allowable transient bearing capacity (psf)[1]	3,325
Min/Max continuous footing widths (in)	18/48
Min/Max spread footing area (ft^2)	4/64
Total settlement (in)	0.75
Differential vertical movement (in)[2]	0.5
Frost depth (in)	42
Min. heated interior foundation embedment (in)	12

1. Describes the allowable increase in the bearing capacity for short-term loads such as wind and seismic. The increased live loads from game events should not be considered transient.
2. Based on a span length of 100 feet. Thus, if the value is 0.5 inches, then differential movement is 1 inch for a span of 200 feet.

We strongly recommend the installation of a perimeter drain system regardless of the initial soil moisture at the time of exploration. The drain system should include a gravel filter that extends vertically to a termination within slotted or standard casing. Alternatively, a geosynthetic such as Mirafi G100N may be used in place of the vertical gravel drain.

Slab-on-grade

Slabs-on-grade may also be supported by Engineered Aggregate Piers (EAPs), without requiring overexcavation and replacement with engineered fill below the slab. For this recommendation to be valid, the EAPs must be installed in a grid pattern across the entire building footprint. We recommend that EAPs be designed and installed by a qualified specialty contractor to limit settlement to 0.5 inches or less.

To help bridge between the EAPs, and to reduce inconsistencies between the native subgrade soils and the slab, we recommend 4 inches of WYDOT Grade W aggregate be conditioned, placed, and compacted below the slab.

If EAPs are installed only to support the footings, but not throughout the entire building footprint, slab-on-grade construction should be supported on engineered fill as described in the original geotechnical report. The client should be prepared for some additional differential movement, as the EAPs around the perimeter of the structure will limit settlement around the slab's perimeter as well.

Closure

This report addendum addresses Engineered Aggregate Pier recommendations for the Wind River Tribal Fish and Game Office. All other recommendations provided within the original report dated March 4, 2026 are considered valid.

Regards,

Shantel Ramlo, P.E.
Geotechnical Engineer

Professional Engineer
SHANTEL RAMLO
20105
WYOMING

Digitally signed by Shantel Ramlo
Date: 2026.10.16 16:34:44-05'00'

SECTION 00 4100
BID FORM

THE PROJECT AND THE PARTIES

TO:

Wind River Sage Fund, Inc. (Owner)
Frank B. Wise Business Center
3 Ethete Road
Or P.O. Box 661
Fort Washakie, WY 82514

FOR:

Construction of a 17,000 s.f. pre-engineered metal building which includes reception and lobby, gift shop, office and training, vehicle storage, and support spaces. The building will include all necessary mechanical, electrical, plumbing, and fire protection systems.

Project: Ecotourism Visitors Center

Address:
221 Ethete Road
Fort Washakie, Wyoming 82514

DATE: _____ (BIDDER TO ENTER DATE)

SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

Bidder's Full Name _____
Address _____
City, State, Zip_____

BASE BID OFFER - COMPLETE PROJECT - MATERIALS AND LABOR

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by Brunton Architects and Engineers for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

We have included the required security deposit as required by the Instruction to Bidders.

We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.

All applicable federal taxes are included and State of Wyoming taxes are included in the Bid Sum.

MATERIALS (ITEMIZED COST)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

LABOR (ITEMIZED COST)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

ALTERNATES

DEDUCT ALTERNATE #01

Base Bid Item: Base Bid Item: Provide and install all interior finishes and fixtures in rooms east of grid 2 as indicated in the Bid Documents.

Alternate Item: Provide a deduct value to omit the interior finishes in rooms east of grid 2: finish flooring, ceilings, wall base, paint, refrigerators and freezers with associated track, restroom fixtures, and electrical fixtures. Wall and doors along grid 2 shall remain.

Materials (Itemized Cost)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

Labor (Itemized Cost)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

DEDUCT ALTERNATE #02

Base Bid Item: Accept Alternate 1.

Alternate Item: Provide a deduct value to omit the concrete slab and underground utilities in the area east of grid 2. Mechanical ventilation system serving rooms east of grid 2 shall remain.

Materials (Itemized Cost)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

Labor (Itemized Cost)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

DEDUCT ALTERNATE #03

Base Bid Item: Accept Alternates 1 and 2.

Alternate Item: Provide a deduct value to omit building construction east of grid 2. The pre-engineered metal building endwall, and associated foundation, along grid 1 shall shift west 24’-8”. Coordinate mechanical, electrical, and structural requirements.

Materials (Itemized Cost)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

Labor (Itemized Cost)

Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for 45 days from the bid closing date.

If this bid is accepted by Owner within the time period stated above, we will:

1. Execute the Agreement within seven days of receipt of Notice of Award.
2. Furnish the required bonds within seven days of receipt of Notice of Award.
3. Commence work within seven days after written Notice to Proceed of this bid.

If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

CONTRACT TIME

If this Bid is accepted, we will:

Substantially complete the Work by March 1, 2028.

If the work has not been completed in the time scheduled, the Contractor shall pay as Liquidated Damages, the amount of $200 per calendar day for each day past the completion date until the project is substantially complete.

CHANGES TO THE WORK

When Architect establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, the percentage fee will be:

Ten percent overhead and profit on the net cost of work self performed by General Contractor, and Five percent mark up on subcontracted work.

Subcontractor overhead and profit mark up on own work shall be Ten percent.

ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

1. Addendum # _____ Dated _____.
2. Addendum # _____ Dated _____.
3. Addendum # _____ Dated _____.
4. Addendum # _____ Dated _____.

2.01 BID FORM SIGNATURE(S)

A. The Corporate Seal of

B. _____

C. (Bidder - print the full name of your firm)

D. was hereunto affixed in the presence of:

E. _____

F. (Authorized signing officer, Title)

G. (Seal)

H. _____

I. (Authorized signing officer, Title)

2.02 IF THE BID IS A JOINT VENTURE OR PARTNERSHIP, ADD ADDITIONAL FORMS OF EXECUTION FOR EACH MEMBER OF THE JOINT VENTURE IN THE APPROPRIATE FORM OR FORMS AS ABOVE.

END OF SECTION

SECTION 00 5000
CONTRACTING FORMS AND SUPPLEMENTS

PART 1 GENERAL

1.01 CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID LICENSE TO USE ALL COPYRIGHTED DOCUMENTS SPECIFIED BUT NOT INCLUDED IN THE PROJECT MANUAL.

1.02 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. SEE SECTION 00 7200 FOR THE GENERAL CONDITIONS.

B. THE AGREEMENT FORM IS AIA A101

C. THE GENERAL CONDITIONS ARE AIA A201.

1.03 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in the Contract Documents.

B. Bond Forms:
   1. Performance and Payment Bond Form: AIA A312.

C. Post-Award Certificates and Other Forms:
   1. Submittal Transmittal Form: AIA G810
   2. Schedule Of Values: AIA G703
   3. Application for Payment Form: AIA G702 and G703

D. Clarification and Modification Forms:
   1. Supplemental Instruction Form: AIA G710
   2. Construction Change Directive Form: AIA G714
   3. Change Order Form: AIA G701.

E. Closeout Forms:
   1. Certificate of Substantial Completion Form: AIA G704.

1.04 REFERENCE STANDARDS

A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.

B. AIA A201 - General Conditions of the Contract for Construction; 2017.

C. AIA A312 - Performance Bond and Payment Bond; 2010.

D. AIA G701 - Change Order; 2017.

E. AIA G702 - Application and Certificate for Payment; 1992.

F. AIA G703 - Continuation Sheet; 1992.

G. AIA G704 - Certificate of Substantial Completion; 2017.

H. AIA G710 - Architect's Supplemental Instructions; 2017.

I. AIA G714 - Construction Change Directive; 2017.

J. AIA G810 - Transmittal Letter; 2001.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 7200
GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

1.01 GENERAL CONDITIONS

A. The General Conditions of the Contract for Construction shall be the AIA Document A201-Current Edition - General Conditions of the Contract for Construction. Copies of the A201 are available for public view at the office of the Architect.

SUPPLEMENTARY CONDITIONS

2.01 REFER TO DOCUMENT 00 7300 - SUPPLEMENTARY CONDITIONS FOR AMENDMENTS TO THESE GENERAL CONDITIONS.

END OF SECTION

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 __ day of __ in the year __
(In words, indicate day, month and year.)

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

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

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

Ecotourism Visitors Center

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

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes 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 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.

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 A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

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.

[ ] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 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.

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 _ ($ __), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

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)

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

§ 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

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

DRAFT

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 an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the 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 ( ) days after the Architect receives the Application for Payment.
(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 of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 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.

§ 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 That portion of the Contract Sum properly allocable to completed Work;

.2 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; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 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:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

§ 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.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 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.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.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.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

%

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.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

DRAFT

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[ ] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

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.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

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

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

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

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with a building information modeling exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with a building information modeling exhibit, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 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 Building information modeling exhibit, dated as indicated below:
(Insert the date of the building information modeling exhibit incorporated into this Agreement.)

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

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.)

DRAFT

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

[ ] The Sustainability Plan:

Title	Date	Pages

[ ] 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.)

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

OWNER *(Signature)*

(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)

DRAFT

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 18:30:43 CDT on 07/22/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6a610c151a46745f8b9

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

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

Ecotourism Visitors Center
221 Ethete Rd.
Fort Washakie, Wyoming 82514

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

ADDITIONS AND DELETIONS:
The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes 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 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™–2017, Guide for Supplementary Conditions.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. “The American Institute of Architects,” “American Institute of Architects,” “AIA,” the AIA Logo, and “AIA Contract Documents” are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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
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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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
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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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**
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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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**

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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 PROVISIONS
13
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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

Project, Definition of
1.1.4
Project Representatives
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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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
13.2

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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. All rights reserved. “The American Institute of Architects,” “American Institute of Architects,” “AIA,” the AIA Logo, and “AIA Contract Documents” are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 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.

§ 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.

§ 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. 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.

§ 1.2 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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.

§ 1.3 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.

§ 1.5 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 Except as otherwise provided in Section 1.6.2, 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 written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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 written protocols governing the use of, and reliance on, the information contained in the model 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. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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 the 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 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 default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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.

§ 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.

§ 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.

§ 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.

§ 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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.

§ 3.4.2 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 skilled in tasks assigned to them.

§ 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 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes 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.

§ 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 If the Contractor performs Work knowing it 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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.

§ 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.

§ 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. 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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.

§ 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. 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.

§ 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.

§ 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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 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.

§ 3.14 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. 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.

§ 3.15.2 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.

§ 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 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, 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, 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), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 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.

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 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. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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 reasonably 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.

§ 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 has authority to 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.

§ 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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 decide matters 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 and decisions 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 decisions, 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.

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, as soon as practicable 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.

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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 Subcontractual 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.

§ 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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.

§ 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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.

§ 7.3 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, 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:

.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.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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.

§ 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.

§ 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.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

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

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

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 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 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 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 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. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims,

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 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 either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

§ 9.5.4 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 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.

§ 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 Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. 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 for 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. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of 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 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 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, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and 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 designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a 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.

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** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, 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 the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 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.

§ 10.2.5 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. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is 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.

§ 10.2.6 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.

§ 10.2.7 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.

§ 10.2.8 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 notify the Owner and Architect of the condition.

§ 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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 reimburse 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.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 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.

§ 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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 Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 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 Waivers of Subrogation

§ 11.3.1 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; (2) the Architect and Architect's consultants; and (3) Separate Contractors, 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 those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 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.

§11.5 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.

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

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

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.

§ 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.

§ 12.3 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 effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 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 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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 tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 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.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 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. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

.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 for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

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 against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice 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 under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, 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, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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.

§ 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 scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- **.1** damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- **.2** damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 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.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 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 mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 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.

§ 15.2.8 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 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. “The American Institute of Architects,” “American Institute of Architects,” “AIA,” the AIA Logo, and “AIA Contract Documents” are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

Additions and Deletions Report for

AIA® Document A201® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 16:23:14 CST on 11/02/2026.

PAGE 1:

Ecotourism Visitors Center

221 Ethete Rd.
Fort Washakie, Wyoming 82514

Additions and Deletions Report for AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. “The American Institute of Architects,” “American Institute of Architects,” “AIA,” the AIA Logo, and “AIA Contract Documents” are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Subscription No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 16:23:14 CST on 11/02/2026 under Order No. 20250124141 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ - 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

AIA Document D401 – 2003. Copyright © 1992 and 2003. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:23:14 CST on 11/02/2026 under Order No.20250124141 which expires on 05/02/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (6ae90d2b974f9d9298430b8e)

SECTION 00 7300
SUPPLEMENTARY CONDITIONS - AIA

GENERAL INFORMATION

1.01 INSTRUCTIONS

A. These supplementary conditions amend or supplement the General Conditions of the Contract for Construction (AIA A201 - Latest Edition) and other provisions of the contract documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

B. The terms used in these Supplementary Conditions that are defined in the General Conditions of the Contract for Construction (AIA A201 - latest edition) have the meanings assigned to them in the General Conditions.

1.02 ARTICLE 11.1.2 INSURANCE:

A. Add the following Paragraph as follows:

Insurance:

The Contractor shall secure and maintain such insurance from an insurance company authorized to write casualty insurance in the State where the work is located as will protect himself, his subcontractors and which shall indemnify and save harmless the Owner and the Architect/Engineer and their officers, agents, and employees from and against all claims for bodily injury, death or property damage which may arise from the Contractor's operations under this contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by the Contractor and Subcontractor.

The Contractor shall not commence work under this Contract until he has obtained all insurance required under this section and shall have filed the certificate of insurance with the Owner and a copy with the Owner's attorney. Each insurance policy shall contain a clause assuring the insurance company will not cancel the insurance without thirty days written notice to the Owner, the Owner's attorney, and the Architect/Engineer of intention to cancel. The amounts of such insurance shall be not less than the following, or greater if required by law:

1. Worker’s Compensation:
   a. State Statutory
   b. Applicable Federal Statutory
      (e.g. Longshoremen's)
   c. Employer's Liability $100,000
2. Comprehensive General Liability (including Premises- Operations; Independent Contractors' Protective; products and Completed Operations; Broad Form Property Damage):
   a. Bodily Injury: Name Owner as additional insured:
      1) $1,000,000 Each Occurrence
   b. Property Damage:
      1) $200,000 Each Occurrence
      2) $200,000 Annual Aggregate
   c. Products and Completed Operations to be maintained for two years after final payment.
   d. Property Damage Liability Insurance shall provide X, C, or U coverage as applicable.
3. Contractual Liability
   a. Bodily Injury:
      1) $500,000 Each Occurrence
   b. Property Damage:
      1) $200,000 Each Occurrence
      2) $200,000 Annual Aggregate
4. Personal Injury with Employment Exclusion deleted:
   a. $500,000 Annual Aggregate

5. Comprehensive Automobile Liability:
    a. $1,000,000 Combined Single Limit (CSL)
        1) Combined single limit for bodily injury and property damage of not less than amount above per occurence.

B. NOTE: The State of Minnesota has a no-fault automobile insurance requirement. The Contractor shall be certain coverage is provided which conforms to any specific stipulation in the law.
    1. Umbrella Excess Liability: Name Owner as additional insured:
        a. $1,000,000 Over primary insurance
        b. $10,000 Retention for self-insured hazards each occurrence.

1.03 ARTICLE 11.3.1 PROPERTY INSURANCE:

A. The Contractor shall provide and pay for complete "All Risk" Builders Risk Insurance for this project.

END OF SUPPLEMENTARY CONDITIONS

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Ecotourism Visitors Center

B. Owner's Name: Wind River Sage Fund, Inc.

C. Architect's Name: Brunton Architects, Ltd.

D. The Project consists of the construction of a 17,000 s.f. pre-engineered metal building which includes reception and lobby, gift shop, office and training, vehicle storage, and support spaces. The building will include all necessary mechanical, electrical, plumbing, and fire protection systems.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Bid Form and Project Manual.

1.03 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:
   1. Work by Others.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Time Restrictions:
   1. Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm unless approved by Owner otherwise.

E. Utility Outages and Shutdown:
   1. Prevent accidental disruption of utility services to other facilities.

1.05 WORK SEQUENCE

A. Coordinate construction schedule and operations with Architect.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.

B. Document 00 7200 - General Conditions and Document 00 7300 - Supplementary Conditions: Additional requirements for progress payments, final payment, changes in the Work.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.

C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

D. Forms filled out by hand will not be accepted.

E. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

F. Execute certification by signature of authorized officer.

G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

I. Submit one electronic copy of each Application for Payment.

J. Include the following with the application:
   1. Transmittal letter as specified for submittals in Section 01 3000.
   2. Construction progress schedule, revised and current as specified in Section 01 3000.
   3. Partial release of liens from major subcontractors and vendors.
   4. Affidavits attesting to off-site stored products.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to project manager of contracting firm.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

E. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

F. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

G. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

H. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

I. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

"General Decision Number: WY20260041 06/18/2026

State: Wyoming

Construction Types: Building

Counties: Wyoming Counties of
Albany, Big Horn, Campbell, Carbon,
Converse, Crook, Fremont, Goshen, Hot
Springs, Johnson, Laramie, Lincoln,
Natrona, Niobrara, Park, Platte,
Sheridan, Sublette, Sweetwater, Teton,
Uinta, Washakie and Weston

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026
2	06/18/2026

SAWY2026-001 05/01/2026

	Rates	Fringes
ASBESTOS REMOVAL, ABATEMENT AND DEMOLITION	$ 23.00	0.00
BLINDS/WINDOW-COVERING INSTALLER	$ 12.46	0.00
BOILERMAKER	$ 44.37	28.26
BRICKLAYERS AND MASONS	$ 33.61	5.22
CARPENTERS AND JOINERS	$ 35.04	12.39
CARPET, LINOLEUM AND RESILIENT TILE LAYERS	$ 34.63	0.00
CEMENT MASONS/PLASTERERS	$ 26.00	2.41
ELECTRICIANS	$ 38.47	10.96
ELEVATOR CONSTRUCTORS	$ 58.95	43.59
FIRE SPRINKLER INSTALLERS	$ 34.02	7.76
FIRE SYSTEM INSTALLERS (NON-WATER)	$ 30.88	3.97

GENERAL LABORERS: GROUP 1 AXMEN, HAND FALLER; BIN WALL INSTALLER; BITUMINOUS CURB BUILDER; BURNER (CUTTING TORCH); CAR OR TRUCK LOADER; CONCRETE SAW; CONCRETE VIBRATOR; CONCRETE WORKER; CREOSOTE MATERIAL HANDLER; DUMPMAN; ERECTOR/INSTALLER (INCLUDES FENCES, GUARDRAIL, GUIDEPOSTS, ETC.); FLAGMAN; FORM SETTER; FORM STRIPPER; GENERAL LABORER; HAND OPERATED VIBRATOR ROLLER; JACKHAMMER/PAVEMENT BREAKER; LANDSCAPER; MATERIAL HANDLER; MECHANICAL FORM CLEANER; MORTARMAN; NOZZLEMAN; PIPE SETTER; PIPE WRAPPER; POWER SAW OPERATOR; POWER TYPE CONCRETE BUGGY; PRE-WATERING, PRE-IRRIGATION, AND PRE-WETTING WORK; RIPRAP MAN, RODMAN; SANDBLASTER & POT TENDER; SHORING & LAGGING OPEN DITCH; SIGNALMEN; SCISSORMAN OR HOPPERMAN; STAKE JUMPER; TAMPER OPERATOR; TAR & ASPHALT TENDER; TOOLROOM MAN; WRECKING & DEMOLITION CREWS; UNLOADING AND PACKING.....$ 22.83
0.00
GLAZIERS.....$ 24.03
0.00
IRONWORKER.....$ 30.66
10.16
LIMITED ELECTRICIANS (90 VOLT OR LESS).....$ 35.54
7.66
MARBLE, TILE AND TERRAZZO SETTERS.....$ 33.00
10.00
MECHANICAL, HEAT AND FROST INSULATION.....$ 32.08
6.36
MILLWRIGHT MACHINERY WORKERS.....$ 39.10
21.87
OPERATING ENGINEERS: GROUP 1 A-FRAME TRUCK; AIR COMPRESSOR; ASPHALT PLANT FIREMAN/OILER; AUGER MACHINE (POST HOLE DIGGER); BRAKEMAN; BROOM OPERATOR; BUMP GRINDER OPERATOR; CABLEWAY SIGNALMAN; CHIP SPREADER OPERATOR; CONCRETE MIXER (UP TO 1 YARD); CONCRETE SAW OPERATOR; FARM TYPE TRACTOR; FORKLIFT OPERATOR; FORM GRADER; GENERATOR OPERATOR; GUNITE AND GRANITE MACHINE; HEATER OPERATOR; HEAVY DUTY REPAIRMAN; HOPPERMAN; JOINT MACHINE OPERATOR; LOCOMOTIVE FIREMAN; LONGITUDINAL FLOAT OPERATOR; LUBRICATION & SERVICE ENGINEER; MATERIAL HOIST OPERATOR; MECHANICAL CONVEYOR; MOTORMAN; OIL DISTRIBUTOR; PAVEMENT BREAKER; PUMP OPERATOR; PUMPCRETE OPERATOR (UP TO 4 INCHES); RODMAN/REAR CHAINMAN; SCREED OPERATOR; SCREENING PLANT OPERATOR; TAMPER & SIMILAR MACHINES; TIRE REPAIRMAN; TUGGER HOIST; UNDERGROUND FREEZE UNIT; WELDING MACHINE OPERATOR.....$ 27.69
4.33
OPERATING ENGINEERS: GROUP 2 ASPHALT PLANT OPERATOR; BACKHOE OPERATOR; CABLEWAY OPERATOR; CMI MACHINE & SIMILAR OPERATOR; COMPACTOR OPERATOR; CONCRETE BATCH PLANT OPERATOR; CRUSHING PLANT

OPERATOR; DOUBLE DRUM HOIST; DRILLING MACHINERY OPERATOR; ELEVATING GRADER; FRONT-END LOADER (UP TO 1.5 YARDS); HYDRO-BLAST OPERATOR; JUMBO FORM OPERATOR; KOLMAN TYPE LOADER; LOCOMOTIVE ENGINEER; MAN LIFT ELEVATOR OPERATOR; MIXER OPERATOR (OVER 1 YARD); MUCKING MACHINE OPERATOR; PAVING MACHINE OPERATOR; PUMPCRETE OPERATOR (OVER 4 INCHES); ROLLER OPERATOR; SUB-GRADING MACHINE OPERATOR; TRACTOR WITH POWER ATTACHMENTS; TRENCHING MACHINE OPERATOR.....$ 29.95
4.33
OPERATING ENGINEERS: GROUP 3 DOZER/PUSHCAT; DUAL DRUM MIXER; HYDRO CRANE (UNDER 15 TONS); MOTOR PATROL-GENERAL; SCRAPER; SIDEBOOM CAT OPERATOR; RIGGER; PUGMILL EQUIPMENT OPERATOR.....$ 29.95
4.33
OPERATING ENGINEERS: GROUP 4 FINISHER DOZER OPERATOR; HYDRO CRANE (15 TO 30 TONS); LOADER OPERATOR (1.5 YARDS TO 4 YARDS); PILEDRIVER; SHOVEL, DRAGLINE & CLAMSHELL (2 YARDS).....$ 33.93
5.88
OPERATING ENGINEERS: GROUP 5 CARRY LIFT OPERATOR; CRANES (UNDER 25 TONS); GRADE-ALL; INSTRUMENT MAN; LOADER OPERATOR (4 TO 8 YARDS); MOLE OPERATOR; MOTOR PATROL-FINISHER; PUMPCRETE-MOBILE CRANE OR TRUCK.....$ 50.00
5.88
OPERATING ENGINEERS: GROUP 6 CRANES (25 TO 50 TONS); FOUR DRUM HOIST; HEAVY DUTY REPAIRMAN, WELDER; HYDROCRANE (30 TO 50 TONS); LOADER OPERATOR (OVER 8 YARDS); SCRAPER OPERATOR, TANDEM.....$ 50.00
16.00
OPERATING ENGINEERS: GROUP 7 CRANES (OVER 50 TONS); SHOVELS, DRAGLINES, & CLAMSHELLS (OVER 2 YARDS); WHEEL EXCAVATOR.....$ 50.00
16.00
PAINTERS AND ALLIED TRADES.....$ 24.03
0.00
PLUMBERS AND PIPEFITTERS.....$ 39.95
11.70
ROOFERS.....$ 24.89
3.14
SEMI-SKILLED LABORERS: GROUP 2 ASPHALT RAKER & TAMPER; BRAKEMAN AND VIBRATOR MAN; GUNITE NOZZLEMAN; HIGH SCALAR; MUCKER & BULL GANG LABORER; SANDBLASTER NOZZLEMAN; SEWER PIPE INSTALLER.....$ 23.73
4.28
SHEETMETAL WORKERS.....$ 33.76
5.98
SHEETROCK AND DRYWALL INSTALLERS.....$ 33.41
17.12
TENDERS: GROUP 4 TENDERS BLASTER/POWDERMAN; CARPENTER TENDER; CEMENT MASON TENDER; CHUCK TENDER; DRILL OPERATORS FOR BLASTING & GROUTING;

FORK LIFT OPERATOR; HOD CARRIERS; NIPPER;
PILING/CAISSON WORKER; PLASTERER TENDER; SCAFFOLD
BUILDER; SPADERS; TERRAZZO TENDERS; TILE SETTER
TENDERS; TOP MAN OR TOP LANDER; TUGGERS; TUNNER &
UNDERGROUND WORKER.....$ 27.50
6.91
TRUCK DRIVERS: GROUP 1 CEMENT TRUCK (UNDER 10
YARDS); DUMP TRUCK (UNDER 13 CUBIC YARDS); FLAT
RACK TRUCK; FLEX BOOM-SINGLE AXLE & TWIN SCREW;
FORKLIFT OPERATOR; FUEL/GREASE TRUCK;
GREASE/SERVICE PERSON; LUMBER CARRIER; MATERIAL
CHECKER; PICKUP TRUCK DRIVER; TRUCK DRIVER
DISTRIBUTOR; TRUCK MECHANIC; WAREHOUSE PERSON;
WATER TRUCK (SINGLE AXLE).....$ 24.75
5.05
TRUCK DRIVERS: GROUP 2 CARDEX PERSON; CEMENT MIXER
(OVER 10 YARDS); DUMP TRUCK (OVER 13 CUBIC YARDS);
DUMPSTER TYPE EQUIPMENT; EXPEDITOR; HIGHBOY,
LOWBOY, FLOATS, SEMI-TRUCK; LEAD WAREHOUSE PERSON;
SCALE PERSON/CHECKER/SPOTTER; SNOW PLOW; TIRE
REPAIRMAN; TRUCK/DIESEL MECHANIC; WATER TRUCK
(SEMI, TANDEM AXLE, EUCLID); WINCH POLE-A-FRAME.....$ 27.88
5.05

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
==========
Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to

Executive Order 13658, the contractor must pay all covered workers at least $13.65 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract from May 11, 2026, through December 31, 2026. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than "SU", "UAVG", "SA", or "SC" denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was

updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The "SU" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

"SU" wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The "SA" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the "SA" identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests

for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

==========

END OF GENERAL DECISION

"

SECTION 01 2400
ELECTRONIC CAD REVIT FILE REQUEST

PART 1 GENERAL

1.01 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.

1.02 SUMMARY

A. Section includes administrative and procedure requirements for releasing CAD/Revit files.

B. CAD/Revit Files Request Waiver Form attached.

1.03 PROCEDURE / SUBMITTALS

A. Electronic CAD/Revit files may be made available to Contractors involved in the construction of the project, after bidding is closed and when under Contract with either a Construction Manager or General Contractor. The Architect will determine if any CAD/Revit files will be released to the individual making a request.

B. The released Drawings are not to be used as a substitution for required Shop Drawings.

C. CAD/Revit Files Request, Architectural Drawings: Prior to any release for electronic CAD/Revit files contained in the Architectural Drawings, the Contractor making the request shall review and complete the attached Agreement for Electronic Data Form. Requests for the release shall not occur until the form is completed.

1. Procedure for CAD Request: Requests procedures shall first be made through the Contraction Manager, and then relayed onto the Architect.

D. CAD/Revit Files Request, Engineering Drawings: Electronic CAD/Revit files requests for engineering drawings are subject to separate guidelines as outlined in release forms provided by the Engineering Firm.

1. Procedure for CAD/Revit Files Request: Requests procedures shall first be made through the Construction Manager, and then relayed onto the Architect.

END OF SECTION

MANKATO | 225 BELGRADE AVENUE, NORTH MANKATO, MN 56003
MINNEAPOLIS | 7525 WAYZATA BLVD, ST. LOUIS PARK, MN 55426

Company _____

Address _____

City, State, Zip _____

Data / Document Requested _____

RE: **Notice Regarding Use of BRUNTON REVIT/CAD Files**

Brunton has agreed to provide the undersigned with electronic files and/or documents as requested above. In making use of the provided files, the undersigned must agree as follows:

1. While all electronic data, including CAD/Revit models, may appear to be very accurate, the files being provided have been developed for Brunton's internal use. If questions arise or discrepancies are noted, please discuss with one of Brunton's team members regarding its general state and ask specific questions about portions affecting the undersigned's work.

2. It is of critical importance to realize that Brunton's current expression of project intent is contained in the paper documentation it produces and issues. The user of Brunton's electronic data is to assume, unless specifically directed otherwise, that graphics notations, dimensions, and specifications contained in paper documentation issued by Brunton supersede computer data. The undersigned is responsible to carefully review all current and subsequent project documentation (paper and electronic) to identify inconsistencies and revisions and to make all corrections and revisions to CAD/REVIT data which affect the undersigned's work. The undersigned is also responsible to field verify all dimensions that may affect the undersigned's work.

3. Translation of CAD/REVIT data from one computer system to another can and often will result in the loss of key data. The loss can include portions of dimensions and text, the location or appearance of structure of the data (layering and data attributes). Brunton does not guarantee the data we produce will work on any system, but Brunton will work with the undersigned, to the extent practical, to assist in making use of the data.

4. Ultimately, in using data from the provided electronic files, the undersigned must bear responsibility for the correctness of all measurements, dimensions, inventories, areas, etc. extracted from these files. The undersigned must also bear responsible for any damage that may result to the undersigned computer and/or software as a result of using the provided files.

5. The requested electronic files are for the sole use of the undersigned for their internal use only, and only for the duration of the respective project. They shall not be forwarded or distributed to any other individual without the written consent of Brunton. Brunton shall maintain full ownership of all electronic files being provided. Any unauthorized distribution of CAD/Revit files provided may lead to Brunton being compensated by the undersigned for violation of this agreement at rates determined by Brunton.

Please Sign and return a copy of this waiver for our records.

Date _____ Printed Name _____

Company _____ Signature _____

SECTION 01 2500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 00 2113 - Instructions to Bidders: Restrictions on timing of substitution requests.

B. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

C. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.02 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.03 REFERENCE STANDARDS

A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.

B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.

D. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.

B. Section 00 2113 - Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.

C. Submittal Form (before award of contract):
   1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submittal Form (after award of contract):
   1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

B. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
   1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
   2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
   3. Bear the costs engendered by proposed substitution of:
      a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

C. Substitutions will not be considered under one or more of the following circumstances:
   1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
   2. Without a separate written request.

3.04 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.

3.05 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

END OF SECTION

Advancement of Construction Technology

SUBSTITUTION REQUEST

(During the Bidding Phase)

Project: _____

_____

To: _____

Re: _____

Substitution Request Number: _____

From: _____

Date: _____

A/E Project Number: _____

Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ 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 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings X☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐_____

© Copyright 1996, Construction Specifications Institute,
99 Canal Center Plaza, Suite 300 Alexandria, VA 22314

SUBSTITUTION REQUEST
(After the Bidding/Negotiating Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 1-4 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

☐ Point-by-point comparative data attached — REQUIRED BY A/E

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

_____

Savings to Owner for accepting substitution: _____ ($ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

© Copyright 2013, CSI,
110 S. Union St., Suite 100, Alexandria, VA 22314

Form Version: September 2013
CSI Form 13.1A

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electronic document submittal service.

B. Preconstruction meeting.

C. Progress meetings.

D. Construction progress schedule.

E. Contractor's daily reports.

F. Progress photographs.

G. Submittals for review, information, and project closeout.

H. Number of copies of submittals.

I. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - General Conditions: Dates for applications for payment.

B. Section 01 6000 - Product Requirements: General product requirements.

C. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.

D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 PROJECT COORDINATOR

A. Project Coordinator: General Contractor.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for vehicle access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for Interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. This procedure applies to submittals for review, information, Requests for Interpretation (RFIs), and closeout, progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in allowable format.
   4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
   5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum. Contractor is required to choose from the two options below and include costs for service in bid.

C. Submittal Service: Use one of the following:
   1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com/#sle.
   2. Procore (tel:1-866-477-6267): www.procore.com

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. General Contractor.
   4. Major Subcontractors.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract, Owner and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.

7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum monthly intervals.

B. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.
   6. As appropriate to agenda topics for each meeting..

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of RFIs log and status of responses.
   7. Review of off-site fabrication and delivery schedules.
   8. Maintenance of progress schedule.
   9. Corrective measures to regain projected schedules.
   10. Planned progress during succeeding work period.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.05 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
   1. Date.
   2. High and low temperatures, and general weather conditions.

3. List of subcontractors at Project site.
4. Safety, environmental, or industrial relations incidents.
5. Meetings and significant decisions.
6. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
7. Testing and/or inspections performed.
8. Signature of Contractor's authorized representative.

3.06 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

D. In addition to periodic, recurring views, take photographs of each of the following events:
1. Excavations in progress.
2. Foundations in progress and upon completion.
3. Structural framing in progress and upon completion.

E. Views:
1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
2. Provide factual presentation.

F. Digital Photographs: 24 bit color, minimum resolution of 8 megapixels, in JPG format; provide files unaltered by photo editing software.
1. Delivery Medium: Via email.
2. File Naming: Include project identification, date and time of view, and view identification.
3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.07 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Design data.
3. Shop drawings.
4. Samples for selection.
5. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents. Architect is allowed up to 10 business days for review of submittals.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.08 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.

5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Architect. No action will be taken.

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. When the following are specified in individual sections, submit them at project closeout in conformance to requirements of Section 01 7800 - Closeout Submittals:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

C. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Extra Copies at Project Closeout: See Section 01 7800.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

A. General Requirements:

B. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.

C. Transmit each submittal with a copy of approved submittal form.

D. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

E. Identify Project, Contract, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy. Provide one (1) complete copies of each submittal.

F. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

G. By submitting data, Contractor is certifying that review, verification or Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents, and that required coordination with all other Contractors and all public agencies involved has occurred.

H. Deliver submittals to Architect at business address.

I. Schedule submittals to expedite the Project, and coordinate submission of related items.

J. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

K. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

L. Provide space for Contractor and Architect review stamps.

M. When revised for resubmission, identify all changes made since previous submission.

N. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

O. Submittals not requested will not be recognized or processed.

P. Contractor's shall be fully responsible for any/all costs due to delays caused by lack of responsiveness/timely submittal.

3.12 LIST OF SUBCONTRACTORS

A. Refer to the General Conditions.

B. Propose use of subcontractors or sub-subcontractors who are established, reputable firms of recognized standing with a record of successful and satisfactory past performance. Include the following information: specification section, item of work, subcontractor or supplier, material/manufacturer (as specified will not be allowed), project manager, phone and facsimile numbers. List major sub-subcontractors for mechanical and electrical work. Use only those subcontractors (and sub-sub-contractors, when appropriate) who are acceptable to the Architect and Owner on the Work.

3.13 SCHEDULE OF VALUES

A. Requirements
   1. Submit separate Schedule of Values for each building to Architect ten (10) days prior to first Application For Payment (AIA Form G702, G702a).
   2. Use Schedule of Values only as basis for Contractor's Application For Payment.

B. Form of Submittal
   1. Base format on Sections listed in Table of Contents and break down labor and material separately.
   2. Round off amounts to nearest ten dollars.

3.14 PROCESSING OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Each Contractor shall prepare, review and approve each submittal and then transmit it to the General Contractor.

B. Upon receipt of a submittal from a Contractor, via the General Contractor, the Architect shall review, stamp, mark, initial, and date each submittal as follows:
   1. "NO EXCEPTIONS TAKEN": This indicates that the submittal meets Contract Document requirements, the design intent, and the Architect has no objections to any of the information included with the submittal. The submittal can be distributed by that Contractor.
   2. "MAKE CORRECTIONS NOTED": This indicates that the submittal is essentially acceptable in terms of Project requirements and design intent, but some minor aspect is incorrect, the Architect has indicated a color or finish selection, or other comments have been added to the submittal Resubmittal is not necessary; the submittal can be distributed and utilized as is.
   3. "REVISE AND RESUBMIT": This indicates that major corrections are required to the submittal; it may also indicate that a few changes of major significance need to be made. In this case, the submittal shall be returned to the Contractor through the General Contractor. The Contractor shall correct and resubmit as specified herein.
   4. "REJECTED": This indicates that the submittal is unacceptable. Reasons may include unacceptable manufacturer, incorrect model or product, or incomplete submittal as defined herein. The Architect shall note the reason for rejection and the submittal shall be returned to the Contractor through the General Contractor. The Contractor shall correct and resubmit as specified herein.

C. Upon receipt of a submittal from a Contractor via the Architect, the Consultant shall review and forward each submittal as follows:
   1. If the submittal is acceptable, the Consultant shall stamp, sign, date, and forward it to the Architect for his review as described in Paragraph 3.08.F.
   2. If major corrections are required or the submittal is unacceptable, the Consultant shall indicate the objections, return the submittal to the General Contractor, and send a copy of the submittal to the Architect so that he is aware of the reasons for the Consultant's actions. The Contractor shall correct and resubmit as specified herein.

D. When a submittal is returned by the Architect and resubmittal is not required the Contractor shall:
   1. Review submittal for Architects/Consultant's comments and take appropriate action indicated.
   2. Complete field verifications not possible during earlier review described in Paragraph 1.3.B.
   3. Initial and date submittal again to verify his acceptance and/or resolution of Architect's/Consultant's comments.
   4. Distribute submittal.

3.15 COMMENCEMENT OF WORK

A. The manufacture or construction of any pieces of equipment, device, or other item for which shop drawings, product data, or samples are required to be furnished, shall not commence prior to complete processing of the appropriate submittal.

B. Contractors or any Subcontractor who proceeds without a submittal bearing the Architect's stamp does so at its own risk. Architect shall maintain the right to reject work or materials provided without proper prior submittal.

C. The Approved Submittal must be on site and used in the execution of all work covered by the submittal. It is the installing Contractors sole responsibility to ensure that the Submittal documents used for the execution of the work are the most current and have been reviewed with the General Contractor prior to the execution of the work.

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.

B. Quality assurance.

C. Control of installation.

D. Tolerances.

E. Testing and inspection agencies and services.

F. Contractor's design-related professional design services.

G. Control of installation.

H. Mock-ups.

I. Tolerances.

J. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Document 00 3100 - Available Project Information: Soil investigation data.

B. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.

C. Section 01 3000 - Administrative Requirements: Submittal procedures.

D. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Base design on performance and/or design criteria indicated in individual specification sections.
   1. Submit a Request for Information to Architect if the criteria indicated are not sufficient to perform required design services.

C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
   1. Structural Design: Include calculations for resisting wind loads, anchor locations, loads at points of attachment to building structure, physical characteristics, resulting dimensional limitations as described in Section 08 4413 - Glazed Aluminum Curtain Walls.
   2. Sprinkler Layout: Coordinate with ceiling installation, detailed pipe layout, and hydraulic calculations as described in Section 21 1300 - Fire-Suppression Sprinkler Systems.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
   1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
   2. Include required product data and shop drawings.
   3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
   4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.

1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of inspector.
    d. Date and time of sampling or inspection.
    e. Identification of product and specifications section.
    f. Location in the Project.
    g. Type of test/inspection.
    h. Date of test/inspection.
    i. Results of test/inspection.
    j. Conformance with Contract Documents.
    k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.05 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

C. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.

2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by associated subcontractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship start-up of equipment,test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4533
CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 INTENT AND CONDITIONS

A. Intent
   1. Define and coordinate structural testing and special inspection services.
   2. Provide confidence that the specified work is constructed in compliance with the contract documents and the intent of applicable codes, including Sections 106 and 1704 of the current International Building Code (IBC) as adopted by the current Wyoming State Building Code.
   3. Structural testing and Special Inspection services are intended to assist in determining probable compliance of the work with requirements specified. These services do not relieve the Contractor of responsibility for compliance with the requirements of the contract documents.

B. Conditions
   1. If inspection of fabricator's work is required, the Owner or Architect may require testing and inspection of the work at the plant, before shipment. Owner, Architect and Structural Engineer of Record (SER) reserve the right to reject material not complying with the contract documents.
   2. Testing and inspection shall be performed in accordance with the industry standard used as the reference for the specific material or procedure unless other criteria are specified. In the absence of a referenced standard, tests shall be accomplished in accordance with generally accepted industry standards.
   3. Work shall be checked as it progresses, but failure to detect any defective work or materials shall in no way prevent later rejection if defective work or materials are discovered, nor shall it obligate Owner to accept such work.

1.02 RELATED REQUIREMENTS

A. Refer to PART 2 for technical scope sections regarding specific qualifications, inspections, tests, frequency and standards required.

1.03 DEFINITIONS

A. Testing - Evaluation of systems, primarily requiring physical manipulation and analysis of materials, in accordance with approved standards.

B. Inspection - Evaluation of systems, primarily requiring observation and engineering judgment.

C. Structural Testing and Special Inspection - Structural Testing and Special Inspection Services herein include items required by the IBC as adopted by the current Wyoming State Building Code, and other items which in the professional judgment of the Structural Engineer of Record, are critical to the integrity of the building structure.

D. Conventional Testing and Inspection - Conventional Testing and Inspection Services herein describe those items not specially required by Code but may be considered essential to the proper performance of the building systems.

E. Architect of Record - The prime consultant in charge of overall design and coordination of the project.

F. Structural Engineer of Record (SER) - The Licensed Engineer in responsible charge of the structural design for the project.

G. Licensed Structural Engineer: - A professional engineer with education and experience in the design of structures similar to this project licensed to practice in the state in which the project is located.

H. Testing Agency (TA) - The properly qualified firm performing testing services.

I. Special Inspector (SI) - A properly qualified individual or firm performing special inspections.

J. Building Official - The Officer or his duly authorized representative charged with the administration and enforcement of the Wyoming State Building Code.

K. Continuous -The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.

L. Periodic -The part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.

1.04 REFERENCES

A. ASTM E329-02 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

B. ASTM E43-02 - Standard Practice for Agencies Performing Nondestructive Testing.

C. ASTM C1077-02 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

D. ASTM C1093-95 - Practice for Accreditation of Testing Agencies for Unit Masonry.

E. ASTM D3740-01 - Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

F. International Building Code (IBC), most current edition.

G. Wyoming State Building Code, most current edition.

H. See technical sections of PART 2 for specific references.

1.05 QUALIFICATIONS

A. Testing Agency (TA) - The testing agency shall be an approved independent testing agency acceptable to the Owner, Architect, SER and as noted below:
   1. Authorized to operate in the state in which the project is located and experienced with the requirements and testing methods specified in the technical scope sections of PART 2.
   2. Meeting applicable requirements of Section 1.04 "References".
   3. Testing equipment shall be calibrated at reasonable intervals by devices of accuracy traceable to either the National Bureau of Standards, or to accepted values of natural physical constants.

B. Special Inspector (SI) - The special inspector shall be under the direct supervision of a registered civil/structural engineer, experienced with the type of work requiring structural testing and special inspection.
   1. The categories of special inspector are:
      a. Special Inspector - Technical I, II, and III: Usually an employee of a testing agency.
      b. Special Inspector - Structural I and II: Preferably an employee of the SER's firm.
   2. Unique special inspector requirements, for specific materials and system, are noted in related technical specification sections.

1.06 RESPONSIBILITIES

A. Structural Testing and Special Inspection
   1. Special Inspectors:
      a. Sign the Structural Testing and Special Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.
      b. If requested, attend a pre-construction meeting to review the scope of structural testing and special inspection.
      c. Use the approved design drawings and specifications, supplemented by the approved shop drawings for review of the work.
      d. Test and/or inspect the work assigned for conformance with the building department approved design drawings, specifications and applicable material and workmanship provisions of the Code. Perform testing and inspection in a timely manner to avoid delay of work.

e. Bring discrepancies to the immediate attention of the contractor for correction, confirm that they are corrected and, if uncorrected after a reasonable period of time, bring to the attention of the Structural Engineer of Record, the Building Official, and to the Architect.
f. Submit test and/or inspection reports to the Building Official, Contractor, the Structural Engineer of Record, and other designated persons in accordance with the Structural Testing and Special Inspection Summary Schedule.
g. Submit a final signed report stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications and the applicable workmanship provisions of the Code.

2. Testing Agency:
   a. Sign the Structural Testing and Special Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.
   b. If requested, attend a pre-construction meeting to review the scope of structural testing and special inspection.
   c. When engaged as a special inspector, provide structural testing and special inspection services as previously described.
3. Architect of Record (or other prime consultant):
   a. Complete and sign the Structural Testing and Special Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction. Provide a completed copy of the schedule to all signed parties including Building Official.
   b. If appropriate, arrange and attend a pre-construction meeting to review the scope of structural testing and special inspection. Include Contractor, Building Official, SER, Testing Agency and other parties concerned.
   c. Coordinate the flow of reports and related information to expedite resolution of construction issues.
4. Structural Engineer of Record (SER):
   a. Identify items requiring structural testing and special inspection including special cases.
   b. Define "type" of special inspector required for "description" of work indicated on the structural testing and special inspection schedule.
   c. Complete and sign the Structural Testing and Special Inspection Summary Schedule prior to commencement of construction.
   d. If requested, attend a pre-construction meeting to review the scope of structural testing and special inspection.
   e. Review reports submitted by special inspectors.
   f. If engaged as a special inspector, provide structural testing and special inspection services as previously described.
5. Contractor:
   a. Sign the Structural Testing and Special Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.
   b. If requested, attend a pre-construction meeting to review the scope of structural testing and special inspection.
   c. Post or make available the Structural Testing and Special Inspection Summary Schedule within its office at the job site. Also, provide adequate notification to those parties designated on the schedule so they may properly prepare for and schedule their work.
   d. Provide the special inspectors access to the approved design drawings, approved shop drawings and specifications at the job site.
   e. Review reports submitted by special inspectors.
   f. Retain at the job site all reports submitted by the special inspectors for review by the building official upon request.
   g. Correct in a timely manner, deficiencies identified in inspection and/or testing reports.

h. Provide the special inspector safe access to the work requiring inspection and/or testing.
i. Provide labor and facilities to provide access to the work and to obtain, handle and deliver samples, to facilitate testing and inspection and for storage and curing of test samples.
j. Verification of conformance of the work within specified construction tolerances is solely the Contractor's responsibility.

6. Fabricator:
   a. Sign the Structural Testing and Special Inspection Summary Schedule in conjunction with other responsible parties prior to commencing construction.
   b. Submit a Certificate of Compliance to the Building Official, Special Inspector, and Structural Engineer of Record that the work was performed in accordance with the approved plans and specifications.
7. Building Official (Typical responsibilities noted for information only):
   a. Determine work, which in the Building Officials opinion, involves unusual hazards or conditions in accordance with the IBC.
   b. Review special inspector qualifications.
   c. Accept and sign the completed Structural Testing and Special Inspection Summary Schedule.
   d. Review all fabricators who perform work in their shop, which requires special inspection.
   e. Review reports and recommendations submitted by the special inspectors.
   f. Review the "final signed reports" submitted by the special inspector(s). These documents should be accepted and approved by the building department prior to issuance of a Certificate of Occupancy.
8. Owner:
   a. Establish direct funding to provide for cost of structural testing and special inspection services.
   b. Provide special inspector with approved design drawings, specifications and approved shop drawings.
   c. Provide special inspectors and testing agencies with full access to site at all times.
   d. Sign the Structural Testing and Special Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.

B. Conventional Testing and Inspection
1. Testing Agency:
   a. Test or inspect the work assigned, for conformance with building department approved plans, specifications and applicable workmanship provisions of the IBC.
   b. Bring non-conforming items to the immediate attention of the Contractor, and if uncorrected to the Architect of Record.
   c. Submit test and/or inspection reports to the Architect of Record, the Contractor and other designated persons.
2. Contractor:
   a. Provide adequate notification to testing agency so they may properly prepare for and schedule their work.
   b. Provide testing agency with access to the approved design drawings, approved shop drawings and specifications at the job site.
   c. Correct in a timely manner, deficiencies identified in test and/or inspection reports.
   d. Provide testing agency with safe access to the work requiring testing and inspection.
   e. Provide labor and facilities to provide access to the work and to obtain and handle samples, to facilitate testing and inspection and for storage and curing of test samples.
   f. Verification of conformance of the work within specified construction tolerances is solely the Contractor's responsibility.
3. Architect of Record (or other prime consultant):

a. Coordinate the flow of reporting and related information to expedite resolution of construction issues.

C. Inspections by Building Official
   1. Contractor shall provide adequate notice for inspections performed by the Building Official, as required by the IBC, the Wyoming State Building Code, and local ordinance.

D. Periodic Site Observations by Design Consultant
   1. Special structural testing and inspection, conventional testing and inspection, and periodic inspections by the Building Official do not preclude the normal field involvement and site observations by Architect or Structural Engineer of Record, nor shall it relieve the Contractor of any responsibility to complete the work in accordance with the approved drawings and specifications.

E. Limits of Authority
   1. Testing agents and/or special inspectors may not waive or alter contract requirements, or approve or accept any portion of the work unless specifically authorized by the Architect or Structural Engineer of Record. They may not assume any duties of the Contractor, and they have no authority to stop or reject "Work".

1.07 PAYMENT

A. Owner shall employ and pay for services of the testing agency to perform required Conventional Testing and Inspection.

B. Unless noted otherwise, the Contractor shall provide and pay for all materials, samples, mock-ups, and assemblies required for testing and inspection and shall pay for all shipping costs related to delivery of this work. Testing agency will pay for shipping costs of samples transported from site to lab.

C. If exploratory work is required to determine the cause of defects, the cost of such work shall be paid by the Contractor, if the work is found to be defective, in the judgment of the Architect/Engineer. Contractor shall reimburse the Owner for all costs incurred in this event.

D. Any tests required to qualify the Contractor, or the workmen for any phase of the work, shall be performed at no additional cost to the Owner.

1.08 INSPECTION NOTICE

A. Subcontractor shall provide minimum of 24 hours notice for all items requiring testing or inspection. Items requiring testing and inspection services prior to or during placement shall not be placed until testing and inspection services are available. Items requiring testing and inspection services after placement shall not be enclosed or obscured until testing and inspection services are performed.

1.09 REPORTS

A. Testing agency and/or special inspectors shall submit reports in accordance with the Structural Testing and Special Inspection Summary Schedule and shall conduct and interpret tests and inspections and state in each report whether; (1) test specimens and observations comply with Contract Documents, and specifically state any deviations, (2) record types and locations of defects found in work, (3) record work required and performed, to correct deficiencies.

B. Reports for structural testing and special inspection, shall be submitted in timely manner to the Contractor, Building Official, SER, and Architect of Record.
   1. Submit reports for ongoing work, to provide the information noted below:
      a. Date issued.
      b. Project title and number.
      c. Firm name and address.
      d. Name and signature of tester or inspector.
      e. Date and time of sampling.
      f. Date of test or inspection.
      g. Identification of product and specification section.

h. Location in project, including elevations, grid location and detail.
i. Type of test or inspections.
j. Results of tests or inspections and interpretation of same.
k. Observations regarding compliance with Contract Documents or deviations there from.

2. Submit a final signed report stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications and the applicable workmanship provisions of the code.

C. Reports for conventional testing and inspection shall be submitted in a timely manner to the Contractor and the Architect of Record.

1.10 FREQUENCY OF TESTING AND INSPECTION

A. For detailed requirements see technical sections of PART 2.

1.11 PROTECTION AND REPAIR

A. Upon completion of testing, sample-taking, or inspection, the Contractor shall repair damaged work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed surfaces, as judged solely by the Architect/Engineer of Record. Protect work exposed by or for testing and/or inspection and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for testing and/or inspection.

1.12 TESTS TO DEMONSTRATE QUALIFICATION

A. If the Contractor proposes a product material, method, or other system that has not been pre-qualified, the Architect may require applicable tests, to establish a basis for acceptance or rejection. These tests will be paid for by the Contractor.

B. The Architect/Engineer of Record reserves the right to require certification or other proof that the system proposed, is in compliance with any tests, criteria or standards called for. The certificate shall be signed by a representative of an independent testing agency.

PART 2 MATERIALS

2.01 (NOT USED)

PART 3 EXECUTION

3.01 STRUCTURAL TESTING AND SPECIAL INSPECTION PROGRAM SUMMARY

A. The parties involved shall complete and sign the Structural Testing and Special Inspection Summary Schedule. The Program, including Summary Schedule, shall be submitted to the building official for approval prior to issuance of a building permit. The competed schedule includes the following:

1. A specific listing of the items requiring inspection and testing.
2. The associated technical scope sections that define the applicable standards by which to judge conformance with the approved plans and specifications in accordance with the IBC, as adopted by the Wyoming State Building Code. The technical scope sections should also include the degree or basis of inspection and testing; i.e., intermittent/will-call or full-time/continuous.
3. The frequency of reporting, i.e., weekly, monthly, per test/inspection, per floor, etc.
4. The parties responsible for performing the inspection and testing work.
5. The required acknowledgments by each designated party.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Waste removal facilities and services.

F. Project identification sign.

G. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 01 5100 - Temporary Utilities.

1.03 TEMPORARY UTILITIES - SEE SECTION 01 5100

A. Contractor shall pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.08 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Each Contractor shall safeguard at all times its work, tools, equipment, materials and other items stored on the Project site. It is each contractor’s sole responsibility for the security of its materials and equipment.

1.09 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site weekly.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 PROJECT SIGNS

A. **Comply with all EDA requirements**

1.11 FIELD OFFICES

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 5100
TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Provision of electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls:
   1. Temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY

A. Cost: By Contractor.

B. Provide power service required from utility source.

C. Provide temporary electric feeder from existing electrical service at location as directed.

D. Complement existing power service capacity and characteristics as required.

E. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.

F. Provide main service disconnect and over-current protection at convenient location and meter.

G. Permanent convenience receptacles may be utilized during construction.

H. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft to achieve a minimum lighting level of 2 watt/sq ft .

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

C. Maintain lighting and provide routine repairs.

1.05 TEMPORARY HEATING

A. Each Contractor shall provide temporary heat and ventilation to maintain adequate environmental conditions to facilitate progress of its Work, prior to the complete enclosure of the building. Owner shall provide temporary heat and ventilation inside the building after complete enclosure; however, Contractors are required to provide supplemental heat and ventilation for proper execution of its work and to maintain safe working conditions for its employees.

B. Portable heaters shall be standard units meeting requirements of applicable codes and regulations. Heaters may operate by means of gas, oil, or electricity, but shall not produce any affect which is detrimental to the building, health of persons present on the construction site or impact the orderly progress of the project. Provide adequate ventilation for temporary heating equipment.

C. In general, provide temporary heat and enclosure/protection from November 1 to April 1, unless environmental conditions require temporary heat to be provided before or after specified dates to maintain adequate environmental conditions for products and execution of the Work.

D. The permanent heating system shall not be used for temporary heat, unless approved by the Owner. If approved by the Owner, the following paragraphs apply:
   1. When the Project is ready for installation of millwork and finishes, the mechanical contractors shall have the permanent heating and ventilating system ready for use. At this time, if environmental conditions require and the Owner approves, the permanent system may be put into operation.

2. The mechanical contractors shall operate the permanent system and provide proper supervision.
3. The mechanical contractors shall remove and dispose of temporary filters at all return air intakes, pump strainers and in all units and shall provide new filters in each piece of equipment at Substantial Completion.
4. Guarantee periods shall commence at Substantial Completion regardless of prior use of equipment for temporary heat.

E. Cost of Energy: By Contractor.

F. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

G. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.06 TEMPORARY COOLING

A. Cost of Energy: By Contractor.

B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.

C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.07 TEMPORARY WATER SERVICE

A. The Contractor shall provide a source for temporary water for Construction only, if available nearby. Contractor shall provide hoses, containers and transportation of water to work area required for its work.

B. Cost of Water Used: By Contractor.

C. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

D. Connect to existing water source.
1. Exercise measures to conserve water.
2. Provide separate metering and reimburse Owner for cost of water used.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 5110
SAFETY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Safety

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division-1 Specification Sections, apply to this Section.

PART 2 PROCEDURES

2.01 SUBMITTALS

A. Written Safety Program per OSHA Standards.

2.02 REQUIREMENTS

A. Safety is the responsibility of each individual Contractor and their sub-contractors. Each Contractor shall comply with all Safety ordinances and OSHA regulations and requirements while performing the work.

B. Contractors to provide their written safety program to the Construction Site Manager prior to being on site. OSHA fines levied will be charged to the specific violator including fines to others due to their violation.

2.03 SCOPE OF WORK

A. Contractors shall provide Safety programs for all their sub-contractors.

B. Contractor shall have sole responsibility and control over the Contactor’s employees, their sub-contractors and their agents and employees and other persons performing portions of the work under a contract with the Contractor.

PART 3 - EXECUTION

3.01 SAFETY PROGRAM

A. Provide safety programs prior to being on site.

B. Name of Contractor Safety Officer that will inspect all their safety methods and procedures.

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations.

E. Procedures for Owner-supplied products.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 REFERENCE STANDARDS

A. NEMA MG 00001 - Motors and Generators; 2024.

1.03 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. DO NOT USE products having any of the following characteristics:
   1. Made using or containing CFC's or HCFC's.

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 6116.
   2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
   3. Are extracted, harvested, and/or manufactured closer to the location of the project.
   4. Have longer documented life span under normal use.
   5. Result in less construction waste.
   6. Have a published GreenScreen Chemical Hazard Analysis.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:
   1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
   1. Receive and coordinate delivery of products at site; inspect for completeness or damage jointly with Owner.
   2. Handle, store, install and finish products.
   3. Repair or replace items damaged after receipt.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide off-site storage and protection when site does not permit on-site storage or protection.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Do not store products directly on the ground.

J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

K. Prevent contact with material that may cause corrosion, discoloration, or staining.

L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Surveying for laying out the work.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.

C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.

E. Section 01 5100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.

F. Section : Project record documents, operation and maintenance data, warranties, and bonds.

G. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2027.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
   2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

1. Minimize amount of bare soil exposed at one time.
2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

G. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with one copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

I. Periodically verify layouts by same means.

J. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

C. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

L. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

M. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Protect installed work from moisture infiltration or damage due weather conditions.

C. Provide special protection where specified in individual specification sections.

D. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

E. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

F. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

3.12 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Replace filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.

B. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

C. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

D. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

E. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

F. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

G. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

H. Provide service and maintenance of components indicated in specification sections.

END OF SECTION

SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

E. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

B. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Prebid meeting.
   2. Preconstruction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Brunton Architects & Engineers with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit one copy of electronic preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents and electronic copy on flash drive disk in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. General Contractor shall provide three (2) paper copies of Operation and Maintenance Manuals to the Architect for review and distribution upon Substantial Completion.

F. Provide electronic copy on flash drive disk to Owner and Architect that includes scanned as-built record drawings, and operation and maintenance manuals.

G. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

H. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

I. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

J. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

K. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

L. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

M. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

N. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.

e. Maintenance instructions for equipment and systems.
f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Photocopies of warranties and bonds.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

SECTION 03 0516
UNDERSLAB VAPOR BARRIER - STEGO

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

PART 2 PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Retarder:
   1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
   2. Thickness: 20 mils.
   3. Product:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier (20-mil): www.stegoindustries.com/#sle.

B. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install vapor retarder in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor retarder under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches.

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor retarder is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

SECTION 03 1000
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 03 3000 - Cast-in-Place Concrete.

C. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary.

B. ACI PRC-347 - Guide to Formwork for Concrete.

C. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials.

D. ACI SPEC-301 - Specifications for Concrete Construction.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.

B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

C. Protect plastic foam products from damage and exposure to sunlight.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.

C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

D. Comply with relevant portions of ACI CODE-318, ACI PRC-347, and ACI SPEC-301.

2.02 WOOD FORM MATERIALS

A. Form Materials: At the discretion of the Contractor.

2.03 REMOVABLE PREFABRICATED FORMS

A. Preformed Steel Forms: Minimum 16-gauge, 0.0598 inch thick, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

B. Preformed Aluminum Forms: ASTM B221 (ASTM B221M), 6061-T6 alloy, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Preformed Plastic Forms: Thermoplastic polystyrene form liner, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

2.04 FORMWORK ACCESSORIES

A. Form Ties: Removable type, galvanized metal, fixed length, cone type, with waterproofing washer, 1 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
   1. Do not use materials containing diesel oil or petroleum-based compounds.
   2. Composition: Colorless, reactive, water-based compound.

C. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 1200.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 EARTH FORMS

A. Earth forms are not permitted.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Obtain approval before framing openings in structural members that are not indicated on drawings.

F. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Engineer before proceeding.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in passing through concrete work.

B. Locate and set in place items that will be cast directly into concrete.

C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

3.06 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

1. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.07 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION

SECTION 03 2000
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories.

B. Section 03 3000 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary.

B. ACI MNL-66 - ACI Detailing Manual.

C. ACI SPEC-301 - Specifications for Concrete Construction.

D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

E. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

F. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

G. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

H. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.

I. CRSI (DA4) - Manual of Standard Practice.

J. CRSI (P1) - Placing Reinforcing Bars, 10th Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Comply with requirements of ACI MNL-66 Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Plain billet-steel bars.
   2. Unfinished.

B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
   1. Unfinished.

C. Reinforcing Steel: Deformed bars, ASTM A996/A996M Grade 40 (280), Type A.
   1. Epoxy coated in accordance with ASTM A775/A775M.

D. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.02 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

B. Welding of reinforcement is not permitted.

C. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.

PART 3 EXECUTION

3.01 PLACEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Place, support and secure reinforcement against displacement. Do not deviate from required position.

C. Maintain concrete cover around reinforcing as follows:

D. Comply with applicable code for concrete cover over reinforcement.

3.02 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floors and slabs on grade.

B. Concrete foundation walls.

C. Concrete foundations and anchor bolts for pre-engineered building.

D. Joint devices associated with concrete work.

E. Miscellaneous concrete elements, including equipment pads.

F. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.

B. Section 03 2000 - Concrete Reinforcing.

C. Section 03 3511 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary.

B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide.

C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction.

D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

E. ACI PRC-305 - Guide to Hot Weather Concreting.

F. ACI PRC-306 - Guide to Cold Weather Concreting.

G. ACI PRC-308 - Guide to External Curing of Concrete.

H. ACI PRC-347 - Guide to Formwork for Concrete.

I. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials.

J. ACI SPEC-301 - Specifications for Concrete Construction.

K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

L. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates.

N. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.

P. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.

Q. ASTM C150/C150M - Standard Specification for Portland Cement.

R. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.

S. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

T. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.

U. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

V. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

W. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

X. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.

Y. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete.

Z. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.

AA. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).

BB. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

CC. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

DD. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

EE. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

FF. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.

GG. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

HH. ASTM E1155/E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

II. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

JJ. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

KK. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
   3. Indicate proposed mix design complies with fiber reinforcing manufacturer's written recommendations.
   4. Indicate proposed mix design complies with admixture manufacturer's written recommendations.

D. Test Reports: Submit report for each test or series of tests specified.

E. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.

B. Follow recommendations of ACI 305R when concreting during hot weather. Do not place concrete when air temperatures are at or above 95 deg F at time of placement or expected to occur within 24 hours after placement of concrete. Do not place any flatwork concrete (slabs on grade, elevated slabs on deck, concrete toppings) when wind speed exceeds 20 mph at time of casting or anticipated to occur within 24 hours after placement of concrete. Do not place concrete on elevated decks when the total of the temperate (F) plus the wind speed (W mph) divided by 2 exceeds 95 [(T + W/2) > 95] at time of placement or expected to occur within 24 hours after placement of concrete.

C. Follow recommendations of ACI PRC-306 when concreting during cold weather.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, IL/IIL Portland type.
   1. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

C. Fly Ash: ASTM C618, Class F.

D. Calcined Pozzolan: ASTM C618, Class N.

E. Silica Fume: ASTM C1240, proportioned in accordance with ACI PRC-211.1.

F. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

G. Structural Fiber Reinforcement: ASTM C1116/C1116M.

2.02 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

2.03 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:
   1. Sheet Material: ASTM E1745, Class A; 15-mil, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.

2.04 CURING MATERIALS

A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
   1. Product dissipates within 4 to 6 weeks.

B. Moisture-Retaining Sheet: ASTM C171.
   1. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.

C. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.

D. Water: Potable, not detrimental to concrete.

2.05 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

C. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

D. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
   2. Fly Ash Content: Maximum 35 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: As indicated on drawings.
   6. Maximum Slump: As indicated on drawings.
   7. Maximum Aggregate Size: 3/4 inch.

2.06 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Verify that forms are clean and free of rust before applying release agent.

B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI PRC-304.

B. Place concrete for floor slabs in accordance with ACI PRC-302.1.

C. Notify Architect not less than 48 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, and embedded parts will not be disturbed during concrete placement.

F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified in the structural notes

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for compliance with specified tolerances.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values
   1. As given in the structural notes. Flatness requirements apply to on-grade slabs only.

C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155/E1155M, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) or /F(L) .

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.06 CONCRETE FINISHING

A. See structural notes for additional requirements

B. Repair surface defects, including tie holes, immediately after removing formwork.

C. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

D. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height.

E. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   3. Other Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

3.07 CURING AND PROTECTION

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than seven days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:
   1. Final Curing: Begin after initial curing but before surface is dry.
      a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
      b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.08 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

D. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 50 cubic yards or less of each class of concrete placed.

E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.09 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.10 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 04 2616
ADHERED MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured stone.

B. Mortar.

C. Adhesives.

D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 04 0511 - Masonry Mortaring and Grouting.

1.03 REFERENCE STANDARDS

A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2025.

B. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.

C. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

D. ASTM C847 - Standard Specification for Metal Lath; 2018 (Reapproved 2024).

E. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2024.

F. ASTM C1670/C1670M - Standard Specification for Adhered Manufactured Stone Masonry Veneer Units; 2024a.

G. ASTM C1780 - Standard Practice for Installation Methods for Cement-Based Adhered Masonry Veneer; 2026.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

I. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for masonry units, mortar, grout, and adhesive.

C. Samples: Submit Two samples of masonry units to illustrate color, texture, and extremes of color range.

PART 2 PRODUCTS

2.01 MANUFACTURED STONE

A. Manufacturers:
   1. Basis of design: Cornado.
   2. Any current producer member of the Masonry Veneer Manufacturers Association..

B. Manufactured Stone: ASTM C1670/C1670M.
   1. Average Compressive Strength of Five Specimens: 2,100 psi, minimum, with individual specimens having a minimum measured compressive strength of 1,800 psi.
   2. Shear Bond Strength: Minimum 50 psi.
   3. Saturated Density: Not exceeding 15 psf.
   4. Linear Drying Shrinkage: Not exceeding 0.10 percent.
   5. Color, Texture, Range, Special Shapes: As indicated on drawings.

2.02 ADHESIVE MATERIALS

A. Manufacturers:
   1. Bostik Inc; ____: www.bostik-us.com/#sle.

2. LATICRETE International, Inc; LATICRETE MVIS Hi-Bond Veneer Mortar: www.laticrete.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.03 MORTAR MATERIALS

A. Mortar and Grout: See Section 04 0511.

B. Masonry Cement: ASTM C91/C91M Type N.

C. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

D. Mortar Aggregate: ASTM C144.

E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
1. Color(s): As indicated on drawings.

F. Water: Clean and potable.

G. Accelerating Admixture: Nonchloride type for use in cold weather.

H. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

2.04 LATH

A. Metal Lath with Rainscreen Drainage Material: Factory-assembled combination of mesh drainage material and metal lath.
1. Diamond Mesh Metal Lath: ASTM C847, galvanized, self-furring.
a. Weight: 2.5 lb/sq yd, minimum.

2.05 ACCESSORIES

A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

B. Rainscreen Drainage Material:
1. Rainscreen Drainage Mat: Polyester or polypropylene mesh.
a. Thickness: 1/8 inch.
b. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
c. Seam Tape and Bug Screen: As recommended by rainscreen drainage mat manufacturer.
d. Manufacturers:
1) Advanced Building Products, Inc; Mortairvent: www.advancedbuildingproducts.com/#sle.
2) CavClear, a Division of Archovations Inc; CavClear Rainscreen Mat WS (With Scrim): www.cavclear.com/#sle.
3) Keene Building Products; Driwall Rainscreen: www.keenebuilding.com/#sle.
4) Mortar Net Solutions; _____: www.mortarnet.com/#sle.
5) Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify field conditions meet masonry manufacturer's requirements to receive masonry veneer.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify built-in items are in required location and ready for installation of masonry veneer.

3.02 INSTALLATION

A. Manufactured Stone: Install in accordance with ASTM C1780.

B. Install metal lath with rainscreen drainage material in accordance with the manufacturer's instructions.

3.03 COURSING

A. Establish lines, levels, and coursing as indicated on drawings. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Manufactured Stone: Follow pattern as recomended by manufacturer installation instructions.

3.04 PLACING AND BONDING

A. Remove excess mortar as work progresses.

B. Interlock intersections and external corners, except for units laid in stack bond.

C. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove and replace.

D. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.05 MASONRY FLASHINGS

A. Whether or not specifically indicated on drawings, install masonry flashing to divert water to exterior at locations where downward flow of water is interrupted.

1. Extend flashings full width at such interruptions at least 6 inches, minimum, to form watertight pan.

3.06 CUTTING AND FITTING

A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.

3.07 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

3.08 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 04 7200
CAST STONE MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural cast stone.

B. Units required are indicated on drawings as "cast stone".

1.02 RELATED REQUIREMENTS

A. Section 04 0511 - Masonry Mortaring and Grouting: Mortar for setting cast stone.

B. Section 04 2000 - Unit Masonry: Installation of cast stone in conjunction with masonry.

C. Section 07 9200 - Joint Sealants: Sealing joints indicated to be left open for sealant.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary; 2025.

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2026.

C. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2024.

D. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2025.

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.

F. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.

G. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2026.

I. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.

J. ASTM C1364 - Standard Specification for Architectural Cast Stone; 2025.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Test results of cast stone components made previously by the manufacturer.

C. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, and piece numbers.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. A firm with a minimum of 5 years experience producing cast stone of types required for project.
   2. Adequate plant capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the work.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 MOCK-UPS

A. Provide full size cast stone components for installation in mock-up of exterior wall.

B. See Section 01 4000 - Quality Requirements for additional requirements.

C. Approved mock-up will become standard for appearance and workmanship.

D. Mock-up may remain as part of the completed work.

E. Remove mock-up not incorporated into the work and dispose of debris.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.

B. Number each piece individually to match shop drawings and schedule.

C. Store cast stone components and installation materials in accordance with manufacturer's instructions.

D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.

E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.

F. Store mortar materials where contamination can be avoided.

G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Architectural Cast Stone:
   1. American Art Stone: http://www.american-artstone.com/.
   2. Midwest Cast Stone: https://midwestcaststone.com/.
   3. Marcstone: https://marcstone.com/.
   4. Edwards Cast Stone Company: https://edcstone.com/
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ARCHITECTURAL CAST STONE

A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural limestone, complying with ASTM C1364.
   1. Compressive Strength: As specified in ASTM C1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
   2. Freeze-Thaw Resistance: Demonstrated by laboratory testing in accordance with ASTM C1364.
   3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet.
   4. Color: To be selected by Architect from manufacturer's full range.
   5. Remove cement film from exposed surfaces before packaging for shipment.

B. Shapes: Provide shapes indicated on drawings.
   1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch or length divided by 360, whichever is greater, but not more than 1/4 inch.
   2. Unless otherwise indicated on drawings, provide:
      a. Wash or slope of 1:12 on exterior horizontal surfaces.
      b. Drips on projecting components, wherever possible.
      c. Raised fillets at back of sills and at ends to be built in.

C. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI CODE-318.

2.03 MATERIALS

A. Portland Cement: ASTM C150/C150M.
   1. For Mortar: Type I or II, except Type III may be used in cold weather.

B. Coarse Aggregate: ASTM C33/C33M, except for gradation; granite, quartz, or limestone.

C. Fine Aggregate: ASTM C33/C33M, except for gradation; natural or manufactured sands.

D. Admixtures: ASTM C494/C494M.

E. Water: Potable.

F. Reinforcing Bars: ASTM A615/A615M, Grade 40 (40,000 psi), deformed bars, galvanized.
   1. Galvanized in accordance with ASTM A767/A767M, Class I.

G. Steel Welded Wire Reinforcement: ASTM A1064/A1064M, galvanized or ASTM A884/A884M, epoxy coated.

H. Embedded Anchors, Dowels, and Inserts: Type 304 stainless steel, of type and size as required for conditions.

I. Mortar: Portland cement-lime, as specified in Section 04 0511 ; do not use masonry cement.

J. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.

B. Do not begin installation until unacceptable conditions have been corrected.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cast stone components in conjunction with masonry, complying with requirements of Section 04 2616.

C. Setting:
   1. Drench cast stone components with clear, running water immediately before installation.
   2. Set units in a full bed of mortar unless otherwise indicated.
   3. Fill vertical joints with mortar.
   4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

3.03 TOLERANCES

A. Joints: Make all joints 3/8 inch, except as otherwise detailed.
   1. Rake mortar joints 3/4 inch for pointing.
   2. Remove excess mortar from face of stone before pointing joints.
   3. Point joints with mortar in layers 3/8 inch thick and tool to a slight concave profile.
   4. Leave the following joints open for sealant:
      a. Head joints in top courses, including copings, parapets, cornices, sills, and steps.
      b. Joints in projecting units.
      c. Joints between rigidly anchored units, including soffits, panels, and column covers.
      d. Joints below lugged sills and stair treads.
      e. Joints below ledge and relieving angles.
      f. Joints labeled "expansion joint".

B. Installation Tolerances:
   1. Variation from Plumb: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
   2. Variation from Level: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet, or 3/8 inch maximum.
   3. Variation in Joint Width: Not more than 1/8 inch in 36 inches or 1/4 of nominal joint width, whichever is less.

4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.04 REPAIR

A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.

B. Repair with matching touch-up material provided by the manufacturer and in accordance with manufacturer's instructions.

C. Repair methods and results subject to Architect 's approval.

3.05 CLEANING

A. Clean completed exposed cast stone after mortar is thoroughly set and cured.
   1. Wet surfaces with water before applying cleaner.
   2. Apply cleaner to cast stone in accordance with manufacturer's instructions.
   3. Remove cleaner promptly by rinsing thoroughly with clear water.
   4. Do not use acidic cleaners.

B. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

3.06 PROTECTION

A. Protect completed work from damage.

B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.

END OF SECTION

SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members.

B. Structural steel support members.

C. Base plates, _____.

D. Grouting under base plates.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking: Support framing for small openings in deck.

B. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual.

B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.

C. AISC 325 - Steel Construction Manual.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

F. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

K. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric).

L. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

M. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

N. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

O. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments.

P. ASTM E709 - Standard Guide for Magnetic Particle Testing.

Q. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions.

R. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

S. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

T. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

U. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.

V. AWS D1.1/D1.1M - Structural Welding Code - Steel.

W. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections.

X. SSPC-SP 3 - Power Tool Cleaning.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
   2. Connections.
   3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

B. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience.

C. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

D. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Angles, Plates, S Shapes, and M Shapes: ASTM A36/A36M.

B. Rolled Steel Structural Shapes: ASTM A992/A992M.

C. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.

D. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

E. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.

F. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.

G. Unheaded Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563/A563M nuts and ASTM F436/F436M Type 1 washers.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Grout: ASTM C1107/C1107M; non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

J. Shop & Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Fabricate connections for bolt, nut, and washer connectors.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC-SP 3.

B. Shop prime structural steel members. Do not prime surfaces that will be field welded, in contact with concrete, or high strength bolted.

2.04 SOURCE QUALITY CONTROL

A. Welded Connections: Visually inspect all shop-welded connections and test at least ____ percent of welds using one of the following:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

A. Erect structural steel in compliance with AISC 303.

B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components and shear studs indicated on shop drawings.

D. Do not field cut or alter structural members without approval of Architect.

E. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

F. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Welded Connections: Visually inspect all field-welded connections and test as specified in testing schedules on structural drawings:

END OF SECTION

SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof deck.

B. Supplementary framing for openings up to and including 18 inches.

C. Bearing plates and angles.

D. Stud shear connectors.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 18 inches .

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.

F. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel.

H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel.

I. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172.

J. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements.

K. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks.

L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

D. Certificates: Certify that products furnished meet or exceed specified requirements.

E. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.05 QUALITY ASSURANCE

A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

C. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 STEEL DECK

A. Roof Deck: Non-composite type, fluted steel sheet:
   1. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Minimum Base Metal Thickness: As indicated on structural drawings
   4. Nominal Height: 1-1/2 inch.
   5. Profile: Fluted; SDI WR.

2.02 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.

B. Stud Shear Connectors: Made from ASTM A108 Grade 1015 bars.

C. Welding Materials: AWS D1.1/D1.1M.

D. Fasteners: Galvanized hardened steel, self-tapping.

E. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.

F. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.

G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 20 gauge, 0.0359 inch thick sheet steel; of profile and size as indicated; finished same as deck.

B. Roof Sump Pans: Formed sheet steel, 14-gauge, 0.0747-inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On steel supports provide minimum 1-1/2 inch bearing.

C. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.

D. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.

E. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.

F. Weld deck in accordance with AWS D1.3/D1.3M.

G. At deck openings greater than 18 inches in size, provide steel angle reinforcement. as specified in drawings

H. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.

I. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

J. Weld stud shear connectors through steel deck to structural members below.

K. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05 4000
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall framing.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

C. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.

D. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel.

F. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers.

G. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to metal framing systems, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations

C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, and type and location of fasteners, and accessories or items required of related work.

1.06 QUALITY ASSURANCE

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Structural Framing:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. MarinoWARE: www.marinoware.com/#sle.
   3. Steel Construction Systems: www.steelconsystems.com/#sle.
   4. The Steel Network, Inc: www.SteelNetwork.com/#sle.

B. Connectors:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. Simpson Strong-Tie: www.strongtie.com/#sle.

2.02 MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

2.03 STRUCTURAL FRAMING COMPONENTS

A. Wall Studs, Jamb Studs, Headers, and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

2.04 MISCELLANEOUS CONNECTIONS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.

2.05 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

C. Water-Resistive Barrier: ICC-ES AC38 Grade D and 60-minute plastic sheet.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify field measurements and adjust installation as required.

3.02 INSTALLATION - GENERAL

A. Install structural members and connections in compliance with ASTM C1007.

3.03 INSTALLATION OF STUDS

A. Install wall studs plumb and level.

B. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

C. Splicing of studs is not permitted.

D. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

E. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.

F. Attach cross studs to studs for attachment of fixtures anchored to walls.

G. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

3.05 TOLERANCES

A. Studs - Vertical Alignment (Plumbness): 1/8 inch in 10 ft, in accordance with ASTM C1007.

B. Studs - Maximum Variation from True Position: 1/8 inch in accordance with ASTM C1007.

C. Stud Spacing: 1/8 inch from the designated spacing, provided that the cumulative error does not exceed the requirements of the finishing materials in accordance with ASTM C1007.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.

B. Custom Fabrications.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 05 5000 - Metal Fabrications .

C. Section 32 3300 - Site Furnishings: Steel pipe bollards to match other site furnishings.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.

E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

F. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2026.

G. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2026.

H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

I. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).

J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATED ITEMS

A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

2.03 CUSTOM FABRICATIONS

A. Metal bench supports.
   1. Size: 2"x4" tube steel, see drawings for details.
   2. Finish: Primed and painted, color as noted on drawings.

B. Cut metal wind screen panels.
   1. Thickness: As noted on drawings.
   2. Finish: Primed and painted, color as noted on drawings.

C. Wind screen support posts.
   1. Size: 2"x2" tube steel, see structural and architectural drawings for details.
   2. Finish: Primed and painted, color as noted on drawings.

D. Trash enclosure frame.
   1. Size: tube steel sizes vary, see drawings for details.
   2. Finish: Primed and painted, color as noted on drawings.

2.04 FINISHES - STEEL

A. Prime Painting: Two coats.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roofing nailers.

B. Preservative treated wood materials.

C. Fire retardant treated wood materials.

D. Miscellaneous framing and sheathing.

E. Communications and electrical room mounting boards.

F. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2024).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.

F. ICC (IBC)-2018 - International Building Code; 2018.

G. PS 1 - Structural Plywood; 2023.

H. PS 2 - Performance Standard for Wood Structural Panels; 2019.

I. PS 20 - American Softwood Lumber Standard; 2025.

J. WCLIB (GR) - WCLB Standard Grading Rules for West Coast & Imported Softwood Lumber No.18; 2024.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Fire-Rated PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Manufacturers:
      a. Lonza Group: www.wolmanizedwood.com.
      b. Hoover Treated Wood Products, Inc: www.frtw.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.
   3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Treat rough carpentry items as indicated .

c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.
4. Size and Location: As indicated on drawings.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

3.08 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.

C. Section 09 9000 - Painting and Coating: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

C. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

F. AWI (QCP) - Quality Certification Program; Current Edition.

G. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

H. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

I. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

J. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.

K. BHMA A156.9 - Cabinet Hardware; 2020.

L. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

M. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

N. NHLA G-101 - Rules for the Measurement and Inspection of Hardwood and Cypress; 2023.

O. PS 1 - Structural Plywood; 2023.

P. PS 20 - American Softwood Lumber Standard; 2025.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide instructions for attchment hardware and finish hardware.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft.

1.06 QUALITY ASSURANCE

A. Plywood: Certified by the American Plywood Association.

B. Hardwood Lumber: In accordance with NHLA Grading Rules; www.natlhardwood.org.

C. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

D. Quality Certification:
   1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.

E. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect materials in accordance with manufacturer's written instructions.

B. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Unless otherwise indicated provide products of quality specified by AWI Architectural Woodwork Quality Standards Illustrated for Custom grade.

C. Unless otherwise indicated provide products of quality specified by Woodwork Institute Manual of Millwork for Custom grade.

D. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

E. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Plastic Laminate
   2. Loose Shelving: Melamine Shelving.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 LUMBER MATERIALS

A. Hardwood Lumber: Maple species, plain sawn, maximum moisture content of 6 percent; with vertical grainof quality suitable for transparent finish.

2.04 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B. Hardwood Plywood: Face species Maple, plain sawn, book matched, medium density fiberboard core; glue type as recommended for application.

2.05 PLASTIC LAMINATE MATERIALS

A. Plastic Laminate: NEMA LD 3, HGS; color as selected by Architect, as indicated on drawings.

B. Low Pressure Laminate: Melamine; as selected by Architect as indicated on drawings.

C. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.06 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Concealed Joint Fasteners: Threaded steel.

2.07 ACCESSORIES

A. Lumber for Shimming and blocking: Softwood lumber of ceder species.

B. Cellular PVC Trim: Extruded, expanded PVC; UV-resistant, heat-stabilized, and rigid material.

C. Wood Filler: Solvent base, tinted to match surface finish color.

2.08 HARDWARE

A. Hardware: Comply with BHMA A156.9.

B. Specialty Workstation, Countertop, and Floating Shelf Brackets:
   1. Material: Steel.
   2. Color: White
   3. Manufacturers:
      a. A&M Hardware, Inc ; Concealed Flat Brackets: https://www.aandmhardware.com/concealed-flats.php
      b. Substitutions: See Section 01 6000 - Product Requirements.

C. Americans with Disabilities Act (ADA)-Compliant Vanity and Countertop Brackets:
   1. Color: White.
   2. Products:
      a. A&M Hardware, Inc ; ADA Vanity Brackets: http://www.aandmhardware.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.09 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.

C. Cap exposed plastic laminate finish edges with material of same finish and pattern.

D. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

E. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

2.10 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

D. Install hardware in accordance with manufacturer's written instructions.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Plastic-laminate-faced architectural cabinets.

B. Cabinet hardware.

C. Architectural wood casework accessories.

D. Custom hardwood fabrications.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 2000 - Finish Carpentry.

C. Section 06 6116 - Solid Surfacing.

D. Section 12 3600 - Countertops.

E. Section 05 5000 - Metal Fabrications.

1.03 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program; Current Edition.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

D. BHMA A156.9 - Cabinet Hardware; 2020.

E. GSA CID A-A-1936 - Adhesives, Contact, Neoprene Rubber; 1996a (Validated 2013).

F. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

H. WI (CCP) - Certified Compliance Program (CCP); Current Edition.

I. WI (MCP) - Monitored Compliance Program (MCP); Current Edition.

J. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.

K. ANSI A208.1 - American National Standard for Particleboard; 2009.

L. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.

M. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

N. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

O. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

P. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate locations, elevations, section details, component profiles, assembly methods, joint details, mounting and fastening methods, accessory listings, hardware location and schedule of finishes.

C. Product Data: Provide data for hardware accessories and construction details.

D. Samples: Submit actual samples of architectural cabinet finishes, minimum 3" X 5" , illustrating proposed cabinet finish.

E. Samples: Submit actual samples of cusom hardwood fabrications, minimum 3" X 5" illustrating proposed wood species and finish.

F. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

G. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.
      a. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

D. Quality Certification:
   1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
   2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   3. Provide designated labels on shop drawings as required by certification program.
   4. Provide designated labels on installed products as required by certification program.
   5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
   6. Replace, repair, or rework all work for which certification is refused.

E. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect materials in accordance with manufacturers written instructions.

B. Protect units from moisture damage.

C. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

D. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather.

1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.
   1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
   2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.

B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 WARRANTY

A. All materials and workmanship covered by this section will carry a three (3) year warranty from date of acceptance.

PART 2 PRODUCTS

2.01 CUSTOM CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Plastic Laminate Faced Cabinets: Custom grade.
   1. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2005.
      a. Where no special construction is indicated.

C. Cabinets:
   1. Finish - Exposed Exterior Surfaces: Decorative laminate.
      a. Where no special construction is indicated.
   2. Finish - Exposed Interior Surfaces: Decorative laminate.
      a. Where no special construction is indicated.
   3. Finish - Concealed Interior Surfaces: Melamine.
      a. Where no special construction is indicated.
   4. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
   5. Door and Drawer Front Retention Profiles: Fixed panel.
   6. Casework Construction Type: Type A - Frameless, refer to drawings.
   7. Interface Style for Cabinet and Door: Style 1 - Overlay; flush overlay where indicated on drawings.
   8. Grained Face Layout for Cabinet and Door Fronts: Flush panel.
      a. Custom Grade: Doors, drawer fronts and false fronts wood grain to run and match vertically within each cabinet unit.
   9. Adjustable Shelf Loading: 50 lbs. per sq. ft.
      a. Deflection: L/144.
   10. Cabinet Style: Flush overlay.
   11. Cabinet Doors and Drawer Fronts: Flush style.
   12. Drawer Side Construction: Doweled.
   13. Drawer Construction Technique: Dowel joints.
   14. Finished End Panels shall be provided at all exposed ends. Color and style to match the cabinet face.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 PANEL MATERIALS

A. Plywood for Non-Decorative Purposes: NIST PS 1, Interior rated adhesives, core of wood plies from listed species unless otherwise indicated, thickness as indicated or as required by application.

2.04 LAMINATE MATERIALS

A. Manufacturers:
   1. Wilsonart, LLC: www.wilsonart.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding (3mm): Extruded PVC, flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
   1. Color: To match plastic laminate finish specified

C. Fasteners: Size and type to suit application.

D. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, satin chrome finish, for nominal 1 inch spacing adjustments.

C. Drawer and Door Pulls: "U" shaped wire pull, black anodized aluminum, 4 inch centers.

D. Drawer Slides:
   1. Type: Full extension, 275-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with soft-closing feature.
   2. Static Load Capacity: Commercial grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide soft-closing type.
   6. Manufacturers:
      a. Grass America Inc: www.grassusa.com.
      b. Hettich America, LP: www.hettich.com.
      c. Knape & Vogt Manufacturing Company: www.knapeandvogt.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

E. Hinges: European style concealed soft-closing type, steel with polished finish.
   1. All doors have rubber bumpers.

F. Pull-Out Trash
   1. Manufacturers:
      a. Wurth Baer Supply Company: www.baersupply.com
      b. Substitutions: See Section01 6000-Product Requirements.
   2. Product: Rev-A-Shelf Corporation Bottom Mount Trash Pull-Outs with Soft-Close Slides, Double 35 Quart Plastic Bins
      a. Item #: RS4VLWCSC-1835DM-24VLWCSC-1835DM-2-18

G. Pocket Pivot Door System
   1. Basis of Design: Hafele Accuride 123 Pocket Pivot Door System, Includes 1-3/8" Hinges, Doors up to 30LB
   2. Type: Concealed
   3. Length: 20 inches

4. Load Bearing Capacity: 30 pounds
5. Minimum Door Thickness: 5/8 inch
6. Maximum Door Thickness: 1-1/4 inches
7. Material: Steel
8. Finish: Zinc Plated / Black
9. Manufacturers:
    a. Trademark Hardware: www.tmhardware.com
    b. Substitutions: See Section01 6000-Product Requirements.

H. Hanging File Rail
1. Material: Steel or Aluminum, corrosion-resistant finish
2. File Format: Letter - size
3. Style: Adjustable/removable
4. Locations: As indicated on Drawings

2.07 CUSTOM HARDWOOD BENCHES

A. Fabricate benches from solid hardwood species indicated on drawings.

B. Lumber shall be kiln dried to 6–8 percent moisture content.

C. Provide concealed fastening where exposed.

D. Ease exposed edges to 1/16-inch radius unless noted otherwise.

E. Match wood species, grain orientation, color, and finish as indicated.

F. Fabricate joints tight, flush, and reinforced to prevent movement.

G. Sand exposed surfaces smooth before finishing.

H. Coordinate attachment with supporting construction.

I. Species: As noted on drawings.

J. Grade: Clear Select

K. Thickness: As noted on drawings.

L. Support: 2" x 4" tube steel, primed and painted, color as noted on drawings.

M. Bench Cushion Thickness: As noted on Drawings.

N. Bench Cushion Upholstery: As noted on Drawings.

O. Bench Cushion Core: High-resiliency polyurethane foam, minimum 2.6 pounds per cubic foor density, with Dacron wrap.

P. Bench Cushion Attachment: Hook-and-Loop

Q. Bench Cusion Seams: Boxed cusion with welting.

R. Custom Fabricated Metal Base: See 05 5000 - Metal Fabrications.

2.08 FABRICATION

A. Cabinet Style: Flush overlay.

B. Cabinet Doors and Drawer Fronts: As indicated.

C. Drawer Construction Technique: Dowel joints.

D. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

E. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

F. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

G. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

1. Cap exposed plastic laminate finish edges with plastic trim.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

C. Verify supporting framing and blocking as required.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

3.03 ADJUSTING

A. Test installed work for rigidity and ability to support loads.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06 8316
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

B. Trim.

1.02 REFERENCE STANDARDS

A. 9 CFR 416.2 - Regulatory Requirements Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, Part 416-Sanitation; current edition.

B. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor; 2025.

C. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

D. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

F. FDA Food Code - Chapter 6 - Physical Facilities; Current Edition.

G. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.

H. ISO 846 - Plastics - Evaluation of the Action of Microorganisms; 2019.

I. ISO 2812-1 - Paints and Varnishes -- Determination of Resistance to Liquids -- Part 1: Immersion in Liquids Other than Water; 2017.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one (4"x4") sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Testing Reports
      a. Certified test data from an independent testing agency verifying that products meet or exceed specified requirements.
   2. Inspection Reports
      a. Certified inspection data from an independent agency verifying that products meet or exceed specified requirements.
   3. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   4. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
    1. Operation and Maintenance Data
        a. See Section 01 7000 Execution and Closeout Requirements
    2. Maintenance Materials: Furnish the following for the owner's use in maintenance of the project.
        a. Extra: 5%
        b. See Section 01 6000 Product Requirements
    3. Warranty
        a. Acknowledge warranty duration and scope covered by warranty.

1.04 QUALITY ASSURANCE

A. Manufacturers Qualifications
    1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
    2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
    1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
    2. See Section 01 4000 – Quality Requirements

C. Testing Agency Qualifications
    1. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
    2. See Section 01 4000 – Quality Requirements

D. Sourcing
    1. Single Source Responsibility: Provide and install this work from a single fabricator.

E. Sequencing
    1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.05 WARRANTY

A. Manufacturers Warranty
    1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
    1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fiberglass Reinforced Plastic Panels:
   1. VALTO Engineered Materials: www.valtoem.com.
   2. Marlite, Inc: www.marlite.com.
   3. Nudo Products, Inc: www.nudo.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL SYSTEMS

A. Wall Panels:
   1. Panel Size: To suit application.
   2. Panel Thickness: 0.10 inch.
   3. Surface Design: Smooth.
   4. Color: As selected by Architect.
   5. Attachment Method: Adhesive only, with trim and sealant in joints.

2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
   1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
   4. Sanitation and Cleanability: Comply with 9 CFR 416.2.
   5. Surface Characteristics and Cleanability: Provide products that are smooth, durable, and easily cleanable, in compliance with FDA Food Code, Chapter 6 - Physical Facilities.
   6. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.
   7. Biological Resistance: Rating of 0, when tested in accordance with ISO 846.

B. Trim: To suit application; color coordinating with panel.

C. Adhesive: As recommended by manufacturer, to suit application.

D. Sealant: Type recommended by panel manufacturer; clear.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

E. Install panels with manufacturer's recommended gap for panel field and corner joints.

F. Place trim on panel before fastening edges, as required.

G. Fill channels in trim with sealant before attaching to panel.

H. Install trim with adhesive as required.

I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

J. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bituminous dampproofing.

B. Drainage panels.

1.02 RELATED REQUIREMENTS

A. Section 07 2100 - Thermal Insulation:

1.03 REFERENCE STANDARDS

A. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011 (Reapproved 2023).

B. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2024).

C. ASTM D1227/D1227M - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013 (Reapproved 2024).

D. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide properties of primer, bitumen, and mastics.

C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

1.06 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. W. R. Meadows, Inc: www.wrmeadows.com/#sle.

B. Henry: https://www.henry.com/.

C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BITUMINOUS DAMPPROOFING

A. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Asphalt-Base Emulsion for Metal Protective Coating: ASTM D1187/D1187M, Type II - Continuous weather exposure after drying.
   2. Emulsified Asphalt: ASTM D1227/D1227M, Type II, Class 1 - Mineral colloid emulsifying agents with non-asbestos fibers.
   3. VOC Content: Not more than permitted by local, State, and federal regulations.
   4. Applied Thickness: 1/16 inch, minimum, wet film.

2.03 BITUMEN MATERIALS

A. Cold Asphaltic Type:

1. Emulsified Asphalt: ASTM D1227/D1227M, with fiber reinforcement other than asbestos, Type II, Class 1 or 2.
2. Asphalt Primer: ASTM D41/D41M, compatible with substrate.

2.04 ACCESSORIES

A. Drainage Panel: 3/8-inch thick formed plastic, hollowed sandwich.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.

B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

C. Do not apply dampproofing to surfaces unacceptable to manufacturer.

D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.03 APPLICATION

A. Foundation Walls: Apply two coats of asphalt dampproofing.

B. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

C. Apply bitumen As required to achieve consistent coverage per manufacturer's instructions and requirements..

D. Apply to extent as shown on the construction drawings.

E. Seal items watertight with mastic, that project through dampproofing surface.

F. Place drainage panel directly over dampproofing, butt joints, and position to ensure downward drainage.

G. Place foundation insulation over drainage panel, butt joints, and adhere as required untill backfilling is complete.

H. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at perimeter foundation wall and at entry canopy - see sections.

B. Batt insulation in interior wall construction.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Separate air barrier materials.

B. Section 07 5300 - Elastomeric Membrane Roofing: Insulation specified as part of roofing system.

C. Section 07 8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.

D. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

E. Section 09 2216 - Non-Structural Metal Framing: Acoustic insulation inside walls and partitions.

F. Section 13 3419 - Metal Building Systems: Metal wall panels and roof panels

1.03 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2026.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.06 COORDINATION

A. Coordinate the work with Section 07 2500 for installation of air seal materials.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation at Perimeter of Foundation: Extruded polystyrene board.

B. Insulation Over Metal Stud Framed Canopy, Continuous: Polyisocyanurate board.

2.02 INSULATION FOR METAL BUILDING SYSTEMS

A. See section '13 3419 Metal Building Systems' for insulated metal wall panels and roof insulation details.

2.03 FOAM BOARD INSULATION MATERIALS

2.04 EXTRUDED POLYSTYRENE (XPS) BOARD INSULATION: COMPLIES WITH ASTM C578 WITH EITHER NATURAL SKIN OR CUT CELL SURFACES.

A. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.

B. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.

C. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.

D. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

E. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88) per 1 inch thickness at 75 degrees F mean temperature.

F. R-value; 1 inch of material at 72 degrees F: 5, minimum.

G. Board Thickness: As indicated on Drawings.

H. Board Edges: Square.

I. Thermal Conductivity (k factor) at 25 degrees F: 0.18.

J. Water Absorption, Maximum: 0.3 percent, by volume.

K. Manufacturers:
   1. Dow Chemical Company; CavityMate Plus: www.dow.com.
   2. Firestone Building Products LLC: www.firestonebpco.com.
   3. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com.
   4. DuPont
   5. Hunter
   6. Atlas
   7. Rmax
   8. OX Engineered Products

L. Substitutions: See Section 01 6000 - Product Requirements.

2.05 POLYISOCYANURATE (ISO) BOARD INSULATION (CANOPY APPLICATION): RIGID CELLULAR FOAM, COMPLYING WITH ASTM C1289.

A. Classifications:
   1. Type I: Faced with aluminum foil on both major surfaces of the core foam.
      a. Class 1 - Non-reinforced core foam.
      b. Compressive Strength: 20 psi minimum.
      c. Thermal Resistance, R-value: As indicated on Drawings.

B. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.

C. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

D. Board Size: 48 inch by 96 inch.

E. Board Thickness: As indicated on Drawings.

F. Board Edges: Square.

G. Manufacturers:
   1. Dow Chemical Company; THERMAX Brand ____: www.dowbuildingsolutions.com.
   2. GAF; EnergyGuard Polyiso Insulation: www.gaf.com.
   3. Johns Manville; AP Foil-Faced: www.jm.com.
   4. DuPont Thermax XARMOR
   5. Hunter XCI Class A
   6. Atlas Energyshield Pro
   7. Rmax ECOMAXci FR
   8. OX Engineered Products ISO Redmax

H. Substitutions: See Section 01 6000 - Product Requirements.

2.06 BATT INSULATION MATERIALS

A. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
   1. Material: Glass fiber.
   2. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   3. Manufacturers:

a. CertainTeed Corporation: www.certainteed.com.
b. Johns Manville: www.jm.com.
c. Owens Corning Corporation: www.ocbuildingspec.com.
d. Thermafiber
e. Roxul

4. Substitutions: See Section 01 6000 - Product Requirements.

2.07 ACCESSORIES

A. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
1. Application: Sealing of interior circular penetrations, such as pipes or cables.
2. Width: Are required for application.

B. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.

C. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter where indicated on Drawings.
1. Install in running bond pattern.
2. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Extend boards over expansion joints, unbonded to foundation on one side of joint.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS

A. Install boards horizontally on walls.
1. Place boards to maximize adhesive contact.
2. Install in running bond pattern.
3. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in wall spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

3.06 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 2119
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In exterior wall crevices.
   2. Voids around roof penetrations
   3. At junctions of dissimilar wall and roof materials.
   4. Where indicated on drawings

B. Protective intumescent coating.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).

C. ASTM D1622/D1622M - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2020.

D. ASTM D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics; 2017 (Reapproved 2023).

E. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2025.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

H. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

I. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

C. Certificates: Certify that products of this section meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.

B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience.

1.05 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Foamed-In-Place Insulation:
   1. BASF Corporation; WALLTITE US Series Closed Cell: www.spf.basf.com.
   2. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com.
   3. DuPont
   4. Touch 'n Seal
   5. GCP Applied Technologies
   6. Isolak International
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Monolithic Foamed-In-Place Intumescent Insulation: Medium-density, semi-rigid, two-part, closed cell polyurethane foam; foamed on-site using blowing agent of non-ozone-depleting gas.
   1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and overcoat limitations.
   2. Water Vapor Permeance: 0.99 perms, maximum, when tested at 2.4 inch thickness in accordance with ASTM E96/E96M.
   3. Air Permeance: 0.0014 cfm/sq ft, maximum, when tested at 1-1/4 inch thickness in accordance with ASTM E2178 or ASTM E283 at 1.57 psf.

2.03 ACCESSORIES

A. Primer: As required by insulation manufacturer.

B. Protective Coating: Intumescent type, spray applied; flame spread index (FSI) of 0-25 and smoke developed index (SDI) of 0-450, when tested in accordance with ASTM E84.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

3.04 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Weather Barrier: Membrane that controls movement through the wall of air, water, and water vapor.

B. Water-Resistive Barrier (building wrap): Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant, at walls not enclosing conditioned spaces.

1.02 RELATED REQUIREMENTS

A. Section 07 2100: Thermal Insulation.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

B. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

C. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

D. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, and limitations.

C. Product Data: Include test reports or engineering judgments for each entire wall assembly to verify compliance with NFPA 285.

D. Shop Drawings: Provide large-scale details of special joint conditions.

E. Manufacturer's Instructions: Indicate preparation and installation methods.

F. ABAA Manufacturer's qualification statement: Submit documentation of current evaluation of proposed manufacturer and materials.

1.05 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacterers before, during and after installation.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements. Minimum of 5-years.

PART 2 PRODUCTS

2.01 WEATHER BARRIER

A. Weather Barrier Properties:
   1. Material: Contractor's choice of sheet membrane or liquid-applied membrane. Recommended by manufacturer for temperature at time of application, and for in-service temperature.
      a. Sheet membrane: Completely self-adhering, 4 mil polyethylene film bonded to rubberized bitumen or butyl, 40 mils total thickness.
      b. Liquid-applied membrane: Flexible, monolithic.
   2. Air permeance, ASTM E2178: Maximum 0.004 cubic feet per minute per square foot at pressure differential of 1.57 pounds per square foot.
   3. Vapor permeance, ASTM E96, Method B: Less than 0.1 perm.

4. Manufacturers:
    a. Fluid Applied
        1) Henry Air-Bloc 32MR
        2) WR Gace Perm-A-Barrier VPL LT
        3) WR Meadows Air Shield LSR
        4) Hohmann & Barnard Enviro-Barrier
    b. Sheet Applied
        1) Henry MetalClad
        2) Henry Blueskin Sa
        3) Carlisle Fire Resist 705 FR-A
        4) Carlisle CCW-705 FR-A
        5) GCP Perm-A-Barrier Aluminum Wall Membrane
        6) Soprema Soprasolin HD
        7) Tremco ExoAir 111

2.02 WATER-RESISTIVE BARRIER MATERIALS (NEITHER AIR BARRIER OR VAPOR RETARDER)

A. Water-Resistive Barrier (building wrap), Composite: Tear-resistant polyester sheet with UV-resistant acrylic coating.
    1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
    2. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (Desiccant Method) at 73.4 degrees F.
    3. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for up to 210 days of weather exposure.
    4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
    5. Seam and Perimeter Tape: As recommended by sheet manufacturer.

B. Manufacturers
    1. DuPont Tyvek Commercial Wrap D with Tyvek Fluid Applied Flashing
    2. Substitutions: See Section 01 6000-Product Requirements.

2.03 ACCESSORIES

A. Sealants, tapes, cleaners, primers, adhesives, and other accessories for sealing weather barrier and for sealing weather barrier to substrates and adjacent materials: As specified or as recommended by weather barrier manufacturer.

B. Termination bar: 1 inch wide by 1/8 inch thick by 10 feet long, predrilled 8 inches o.c. stainless steel, type 304; or extruded aluminum, 6063 T5 or T6.

C. Mechanical fasteners: Hot-dip galvanized steel.

D. Penetration seals: As recommended by building membrane manufacturer to provide complete, continuous air and vapor retarder at all penetrations.

PART 3 EXECUTION

3.01 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's instructions.

3.02 INSTALLATION

A. Install materials in accordance with manufacturer's written instructions.

B. Remove material that might puncture retarders or impair adhesion.

C. Clean and prime substrate surfaces to receive weather barrier as recommended by manufacturer.

D. Apply liquid-applied building membrane at thickness required to achieve indicated vapor permeability, 20 mils minimum dry film thickness.

E. Install sheet building membrane with long edge horizontal. Lap vertical seams 4 inches. Lap horizontal seams 2 inches.

F. Seal to perimeter, windows, and penetrations as required to provide a continuous barrier.

G. Lap building wrap and weather barrier to shed water.

H. Seal laps in building wrap with sealing tape.

I. Apply sealant to all edges and joints of termination bar, and along exposed top edge of membrane.

J. Install termination bar entire length of top edge of membrane flashing. Seal top edge with sealant recommended by manufacturer for sealing to membrane flashing.

K. Repair damage to vapor retarder or building wrap by applying a patch, 6 inches larger in each dimension than the damaged area. Continuously tape entire perimeter of patch.

L. Repair damage to weather barrier with same material, lapped 6 inches beyond damaged area in all directions.

M. Water-Resistive Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

N. Mechanically Fastened Sheets - On Exterior:
   1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
   2. Overlap seams as recommended by manufacturer but at least 6 inches.
   3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
   4. For applications specified to be air tight, seal seams, laps, penetrations, tears and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
   5. Install weather barrier and building wrap underneath the jamb flashings.
   6. Install head flashings under weather barrier.
   7. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

O. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
   4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. The Owner's independent testing agency (ITA) will perform testing and inspection.
   1. Cooperate with the ITA.
   2. Allow access to weather barrier work areas and staging.
   3. Do not cover weather barrier work until tested, inspected, and accepted.

C. Do not cover installed weather barriers until required inspections have been completed.

D. Take digital photographs of each portion of the installation prior to covering up.

3.04 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 07 4113.10
METAL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preformed aluminum panels.

B. Attachment system.

C. Secondary framing.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2026.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2025.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.

C. Shop Drawings: Indicate layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
   1. Show work to be field fabricated or field assembled.

D. Samples: For each metal panel system specified, submit samples of minimum size 12 inches square, representing actual metal, thickness, profile, color, and texture.

E. Test Reports: Indicate compliance of metal system with specified requirements.

F. Manufacturer's Instructions.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Executed warranty.

J. Finish warranty.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section and with at least five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.

B. Provide strippable plastic protection on prefinished panels for removal after installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Finish Warranty: Provide 35-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Panel Manufacturers:
   1. Basis of Design: Petersen Aluminum Corporation; PAC-750 Soffitand flush metal panels www.pac-clad.com/#sle.
   2. Lux Architectural Products: https://luxarpro.com/metal-cladding-products/
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLUSH METAL PANEL

A. Flush metal panels:
   1. Profile: Flush wall panel as indicated on the drawings.
   2. Material: Precoated aluminum sheet, 20 guage, 0.032 inch minimum thickness.
   3. Color: As indicated on the drawings from manufacturer's full line of standard finishes.

2.03 METAL SOFFIT PANELS

A. Metal Soffit Panels:
   1. Profile: style as indicated on the drawings, with venting not provided.
   2. Material: Precoated aluminum sheet, 20 gauge, 0.032 inch minimum thickness.
   3. Color: As indicated on drawings from manufacturer's full line of finishes.

2.04 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific system and engineered to meet performance requirements, including anticipated thermal movement.

2.05 SECONDARY FRAMING

A. Material: ASTM A1011/A1011M Designation SS steel sheet.
   1. Profile: Manufacturer's standard cee, zee, asymmetrical zee, hat channel, plain channel, single slope eave strut, double slope eave strut, and angle.
   2. Thickness: 12 gauge, 0.1046 inch.
   3. Finish: Galvanized in accordance with ASTM A653/A653M G90.

B. Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot-dipped galvanized coating and factory-punched holes.

2.06 FABRICATION

A. Panels: Provide factory-fabricated panels with applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

B. Joints: Provide captive gaskets, sealants, or separator strips at panel joints to ensure weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

2.07 FINISHES

A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat metal coil-coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil-coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color and gloss to match sample.

B. Color: As indicated on drawings.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.08 ACCESSORIES

A. Miscellaneous Sheet Metal Items: Provide flashings, trim, moldings, closure strips, and caps of the same material, thickness, and finish as used for the soffit panels and column wraps. Items completely concealed after installation may optionally be made of stainless steel.

B. Sealants:
   1. Exposed Applications: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Applications: Noncuring butyl or tape sealant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation of preformed metal panels until substrates are properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Remove protective film from surface of roof panels immediately prior to installation; strip film carefully to avoid damage to prefinished surfaces.

B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by metal roof panel manufacturer.

C. At locations where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

A. Install soffit system in accordance with approved shop drawings and metal panel manufacturer's instructions and recommendations, as applicable to specific project conditions; securely anchor components of soffit system in place, allowing for thermal and structural movement.
   1. Install metal panel system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
   2. Minimize field cutting of panels. Where field cutting is required, use methods that will not distort panel profiles. Use of torches for field cutting is prohibited.

B. Accessories: Install necessary components required for complete soffit and column wrap assembly, including flashings, trim, moldings, closure strips, and caps.

3.04 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

3.05 PROTECTION

A. Touch-up, repair, or replace damaged metal panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 07 4646
FIBER CEMENT PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiber-cement siding.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Siding Substrate

B. Section 07 2500 - Weather Barriers:

C. Section 07 6200 - Sheet Metal Flashing and Trim.

D. Section 07 9200 - Joinst sealants: Sealing joints between siding and adjacent construction

E. Section 09 2116 - Gypsum Board Assemblies: Siding Substate

1.03 REFERENCE STANDARDS

A. AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rainscreen Wall Cladding Systems; 2022.

B. ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets; 2026.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

E. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

F. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2022.

G. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Characteristics and storage and handling requirements.

C. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, support rails, and anchorage methods.

D. Samples: Two of each siding panel, 12 by 12 inches, illustrating color, pattern, and texture.

E. Test Reports: Submit test report verifying compliance with NFPA 285 for previously tested exterior wall assembly.

F. Manufacturer's Instructions: Indicate installation.

G. Installer's qualification statement.

H. Executed warranty.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.

1.06 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Construct mock-up of each siding type, 3 by 3 feet. Include siding, associated weather barriers, attachments, flashings, insulation, joints, and sealant.

C. Locate where directed by Architect.

D. Mock-up may remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver and store materials in manufacturer's unopened packaging with labels intact.

C. Store materials under dry and waterproof cover, in ventilated area, and elevated above grade on flat surface.

1.08 FIELD CONDITIONS

A. Do not install panels when air temperature or relative humidity are outside manufacturer's limits.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 15-year manufacturer warranty for siding panels. Complete forms in Owner's name and register with manufacturer.

C. Finish Warranty: Provide 15-year manufacturer warranty against excessive finish degradation. Include provision for replacing units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nichiha USA, Inc: www.nichiha.com/#sle.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIBER-CEMENT SIDING

A. Description: Factory-fabricated, drained and back-ventilated (D/BV) rainscreen siding system, site assembled; comply with AAMA 509.

B. Performance Requirements:
   1. Siding Density: Comply with ASTM C1186, Type A, Grade II.
   2. Structural Performance:
      a. Comply with ASTM E330/E330M, using test pressure 1.5 times design wind pressure, with 10-second maximum load duration.
      b. Maximum Allowable Deflection of Panel: L/180 for length (L) of span.
   3. Static Pressure Water Penetration: No water penetration when tested in accordance with ASTM E331 at 2.86 psf pressure difference.
   4. Fire Performance: Tested in accordance with NFPA 285.
   5. Panel Surface Burning Characteristics: Maximum flame spread index of 0 and maximum smoke developed index of 0 when tested in accordance with ASTM E84.
   6. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.

C. Concrete Series Siding: Concrete texture and look; surfaces factory sealed.
   1. Size: 17-7/8 by 71-9/16 inches.
   2. Thickness: 5/8 inch.
   3. Corners: Aluminum trim - corner key.
      a. Finish: Match adjacent panel finish
   4. Orientation: Vertical
   5. Finish: As indicated on the drawings.

D. Wood Series Siding: Wood plank texture with three horizontal grooves; surfaces factory sealed.
   1. Size: 17-7/8 by 71-9/16 inches.

2. Thickness: 5/8 inch.
3. Corners: Premanufactured with 3-1/2-inch returns.
    a. Finish: match panel finish.
4. Orientation: Horizontal.
5. Finish: As indicated on the drawings.

2.03 COMPONENTS

A. Thermal Clip and Rail:
    1. Thermal Clips: JEL 778, zinc-aluminum-magnesium alloy-coated steel.
        a. Joint Tab Attachments: Provide at joints as recommended by manufacturer.
    2. Corner Clips: JE 777C, zinc-aluminum-magnesium alloy-coated steel.
    3. Horizontal Panel Supports: FA 700, aluminum-zinc alloy-coated steel.
    4. Corrugated Spacer: as recommended by the manufacturer.

2.04 ACCESSORIES

A. Trim: Aluminum.
    1. Profiles: Provide compression joint, corner key, H-mold, inside corner, and J-mold trim.
    2. Finish: Match panels.

B. Furring Strips: As indicated on the drawings.

C. Flashing: See Section 07 6200.

D. Fasteners: Galvanized or corrosion resistant; length as required to penetrate fastened surface, minimum 1-1/4 inches.

E. Sealants: As recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify support structure meets manufacturer's requirments to receive siding.

3.02 PREPARATION

A. Protect surrounding areas and adjacent surfaces from damage during execution of work.

3.03 INSTALLATION

A. Install siding and support structure in accordance with manufacturer's instructions.

3.04 TOLERANCES

A. Wall Surface Plane: Level within 1/4 inch in 20 feet.

3.05 REPAIR

A. Touch up, repair, or replace damaged products.

B. All exposed or cut edges shall be sealed in accordance with manufacturer's instructions.

3.06 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Clean siding in accordance with manufacturer’s instructions.

3.07 PROTECTION

A. Protect installed siding from subsequent construction operations.

END OF SECTION

SECTION 07 5300
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, adhered conventional application.

B. Insulation, flat and tapered.

C. Cover Board

D. Roofing stack boots and walkway pads.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers and curbs.

B. Section 07 6200 - Sheet Metal Flashing and Trim: Counterflashings.

C. Section 22 1006 - Plumbing Piping Specialties: Roof drains.

1.03 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

B. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).

C. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).

D. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2024.

E. NRCA (RM) - The NRCA Roofing Manual; 2026.

F. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

G. UL (DIR) - Online Certifications Directory; Current Edition.

H. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of associated counterflashings installed under other sections.

B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

C. Shop Drawings
   1. Showing roof configuration and slope, deck, membrane, and accessory materials fastener manufacturer and type. Shop drawings to be approved by the membrane manufacturer.
   2. The roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains, approved by manufacturer.
   3. For tapered insulation, provide project-specific layout and dimensions for each board.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions, special procedures, and perimeter conditions requiring special attention.

F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

B. Store materials in weather protected environment, clear of ground and moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

D. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within five years after installation.

C. Provide Twenty (20) year manufacturer's material and labor warranty to cover failure to prevent penetration of water.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EPDM Membrane Materials:
   1. Carlisle Roofing Systems, Inc: www.carlisle-syntec.com.
   2. Firestone Building Products, LLC: www.firestonebpco.com.
   3. GenFlex Roofing Systems, LLC: www.genflex.com.
   4. Versico, a division of Carlisle Construction Materials Inc: www.versico.com.
   5. The Garland Company
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation:
   1. Dow Chemical Company: www.dow.com.
   2. GAF: www.gaf.com.
   3. Firestone Building Products, LLC: www.firestonebpco.com.
   4. Owens Corning Corporation: www.owenscorning.com.
   5. Versico, a division of Carlisle Construction Materials Inc; SecurShield Insulation: www.versico.com.
   6. DuPont

7. Hunter
8. Atlas
9. Rmax
10. Ox Engineered Products
11. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOFING - UNBALLASTED APPLICATIONS

A. Elastomeric Membrane Roofing: Fully adhered one ply membrane, fully adhererd cover board, fully adhered rigid insulation, as indicated on drawings.

B. Roofing Assembly Requirements:
   1. Solar Reflectance Index (SRI): Minimum of 7 based on three-year aged value; if three-year aged data is not available, minimum of 6 initial value.
      a. Calculate SRI in accordance with ASTM E1980.
      b. Field applied coating may not be used to achieve specified SRI.
   2. Roof Covering External Fire Resistance Classification: UL (DIR) certified Class A.
   3. Insulation Thermal Resistance (R-Value): Total assembly R-value as indicated on drawings.

C. Acceptable Insulation Types- Constant Thickness Application:
   1. Minimum 2 layers of polyisocyanurate board.
   2. Bottom layer of polyisocyanurate board covered with single layer of polyisocyanurate board.

D. Acceptable Insulation Types- Tapered Application:
   1. Tapered polyisocyanurate board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); non-reinforced; complying with minimum properties of ASTM D4637/D4637M.
   1. Thickness: 0.060 inch (60 mil).
   2. Sheet Width: 76 inch, minimum; factory-fabricate into largest sheets possible.
   3. Color: Black.
   4. Tear Strength: 150 lbf/inch, measured in accordance with ASTM D624.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashing Material: Same material as membrane.

2.04 ROOFING INSULATION

A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type I: Faced with glass mat facers on both major surfaces of the core foam.
         1) Class 1 - Non-reinforced core foam.
         2) Compressive Strength: 20 psi, minimum typical. 60 psi minimum below roof pedestal applications.
         3) Thermal Resistance, R-value: R-6.5 per inch minimum.
   2. Board Size: 48 by 96 inch.
   3. Board Thickness: 2 inches; use as many layers as necessary; stagger joints in adjacent layers.
   4. Board Edges: Square.
   5. Crickets; tapered insulation of same type as specified for top layer; slope away from equipment and as indicated on drawings.

2.05 ROOFING COVER BOARD

A. Insulation Cover Board. Non-combustible, water resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177m, and with the following additional characteristics:

1. Size: 48 inches by 96 inches, nominal
2. Thickness: as indicated on drawings
3. Comply with UL 790 for minimum class C rating

2.06 ACCESSORIES

A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

B. Cant Strips and Tapered Edge Strips: 45 degree face slope and minimum 5-inch face dimension; provide at angle changes between vertical and horizontal planes that exceed 45 degrees.

C. Sheathing Adhesive: Non-combustible type, for adhering gypsum sheathing to metal deck.

D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.

E. Insulation Fasteners: Appropriate for purpose intended.
   1. Provide fully adhered system. Where full adhered is not achievable and approved by architect, mechanically fasten first layer of polyisocyanurate insulation only as recommended by membrane manufacturer.

F. Cover Board Mechanical Fasteners: As recommended by membrane manufacturer.

G. Cover Board Tape Joint: Heat Resistant

H. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

I. Sealants: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 METAL DECK PREPARATION

A. Fasten sheathing to roof deck with continuous mopping of adhesive on each flute.

3.03 INSULATION - UNDER MEMBRANE

A. Attachment of Insulation: Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions.

B. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

C. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

D. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

F. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

G. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.

H. Do not apply more insulation than can be covered with membrane in same day.

3.04 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

D. At intersections with vertical surfaces:
   1. Fully adhere flexible flashing over membrane and up to nailing strips.

E. Around roof penetrations, seal flanges and flashings with flexible flashing.

F. Install roofing expansion joints As recommended by roofing manufacturer. Make joints watertight.

G. Coordinate installation of roof drains and sumps and related flashings.

H. Coordinate installation of associated counterflashings installed under other sections.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field quality control and inspection.

3.06 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings and counterflashings.

B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.

B. Section 07 4646 - Fiber Cement Panels: Flashing and break metal in conjunction with fiber cement panels.

C. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2026.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement; 2025.

E. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples 3 by 3 inch in size illustrating metal finish color.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
   1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
   2. Color: As indicated on drawings.

2.02 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.

E. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

F. Plastic Cement: ASTM D4586, Type I.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Seal metal joints watertight.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping: Firestopping sealants.

B. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.

C. Section 08 8000 - Glazing: Glazing sealants and accessories.

D. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).

B. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

E. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.

F. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. Bostik Inc: www.bostik-us.com.
   2. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us.
   3. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.

4. Pecora Corporation: www.pecora.com.
5. Sika Corporation: www.usa-sika.com.
6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Other joints indicated below.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
      c. Other joints indicated below.
   3. Do not seal the following types of joints.
      a. Intentional weepholes in masonry.
      b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      c. Joints where installation of sealant is specified in another section.
      d. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
   1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
   2. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.

D. Interior Wet Areas: restrooms; fixtures in wet areas include plumbing fixtures, countertops, and other similar items.

2.03 NONSAG JOINT SEALANTS

A. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   1. Color: White.

B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: Match adjacent finished surfaces.

C. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: To be selected by Architect from manufacturer's standard range.

D. Acrylic Latex Sealant: ASTM C834; for use as acoustical sealant and in firestopping systems for expansion joints and through penetrations.
   1. Color: To be selected by Architect from manufacturer's standard range.

2.04 SELF-LEVELING SEALANTS

A. Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
   1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.

B. Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
   1. Durometer Hardness, Type A: 75, minimum, after seven days when tested in accordance with ASTM D2240.
   2. Color: Concrete gray.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

C. Section 09 9000 - Painting and Coating: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. HMMA: Hollow Metal Manufacturers Association.

C. SDI: Steel Door Institute.

D. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2026.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

I. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.

M. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.

N. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, reinforcement and preparations, anchorages, joints, field splices, connections, accessories, moldings, removable stops, conduit and preparations for power, signal, control systems, and any indicated finish requirements.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

C. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

E. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

F. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

1.08 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.09 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.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
   2. Curries, an Assa Abloy Group company: www.assaabloydss.com.

3. Republic Doors, an Allegion brand: www.republicdoor.com.
4. Steelcraft, an Allegion brand: www.allegion.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Edge Profile: Manufacturers standard for application indicated.
   4. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
   5. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   6. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

2.03 HOLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level .
      b. Physical Performance; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Polystyrene, 1 lbs/cu ft minimum density.
      a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
   3. Door Thermal Resistance: R-Value of 6.0 minimum, for installed thickness of polystyrene.
   4. Door Thickness: 1-3/4 inch, nominal.
   5. Top Closures: Flush with top of faces and edges.
   6. Door Face Sheets: Flush.
   7. Weatherstripping: Refer to Section 08 7100.
   8. Door Finish: Factory primed and field finished.

B. Interior Doors, Non-Fire-Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch, nominal.
   4. Door Face Sheets: Flush.

5. Door Finish: Factory primed and field finished.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
   2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
   3. Frame Finish: Factory primed and field finished.
   4. Weatherstripping: Separate, see Section 08 7100.
   5. Insulation: Fiberglass batt or closed-cell spray foam insulation.

C. Interior Door Frames, Non-Fire Rated: Face welded type.
   1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
   2. Frame Finish: Factory primed and field finished.

D. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

E. Mullions for Pairs of Doors: Fixed, with profile similar to jambs.Overlapping metal astragal at exterior doors.

F. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FRAME ANCHORS

A. Jamb Anchors:
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, 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 and not less than 0.042 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.06 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

E. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.

2.07 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.08 ACCESSORIES

A. Glazing: As specified in Section 08 8000.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

C. Astragals for Double Doors: Specified in Section 08 7100.

D. Silencers: Resilient rubber or vinyl, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

2.09 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. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:
   1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
   2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
   3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" 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.

D. Hollow Metal Frames:
   1. Shipping Limitations: 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.
   2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
      a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
   3. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at exterior doors and door openings 42-inches and wider with mortise butt type hinges at top hinge locations.
   4. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
   5. Closer Reinforcements: Fabricate according to ANSI/SDI A250.6 with full sleeve closer reinforcement plates full width of frame minimum 14 gauge.
   6. Electrical Knock Out Boxes: Factory weld 18 gauge electrical knock out boxes to frame for electrical hardware preps; including but not limited to, electric through wire transfer hardware, door position switches, electric strikes, and jamb mounted card readers as specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".
      a. Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.
      b. Conduit to be coordinated and installed in the field (Division 26) from middle hinge box and strike box to door position box.
      c. Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Section "Door Hardware".

7. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
8. Jamb Anchors: Provide number and spacing of anchors as follows:
    a. 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.
9. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template 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 non-template, 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.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

D. Coordinate frame anchor placement with wall construction.

E. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

F. Install door hardware as specified in Section 08 7100.

G. Comply with glazing installation requirements of Section 08 8000.

H. Coordinate installation of electrical connections to electrical hardware items.

3.03 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.04 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid core wood doors with PLAM veneer; flush and flush glazed configuration; non-rated.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

C. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Indicate dimensions and locations of mortises and holes for hardware.
   2. Indicate dimensions and locations of cutouts.
   3. Indicate doors to be factory finished and finish requirements.
   4. Indicate fire protection ratings for fire rated doors.

D. Samples: Submit two samples of door veneer, 6" by 6" inch in size illustrating wood grain, stain color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special installation instructions.

F. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 PROJECT CONDITIONS

A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Solid Core Faced Doors:

B. Basis of Design: VT Industries | Heritage Collection
   1. VT Industries, Inc.: www.vtindustries.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND PANELS

A. Solid Core High Pressure Decorative Laminate (HPDL) Faced Doors:
   1. WDMA Quality grade: Custom.
   2. Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS. Vertical and post formable grade laminates are not acceptable.
   3. Finish: as noted on the door schedule in drawings.
   4. Vertical Edges: Matching HPDL Edge Band applied after faces over Structural Composite Lumber. Matching 1/8 inch (3.2mm) high impact edge bonded to structural composite lumber.
   5. Horizontal Edges: Structural composite lumber. HPDL edge band (top rail only).
   6. Core: Wood-based Particleboard (PC).
   7. Construction: Five Plies; stiles and rails bonded to core, and entire unit is abrasive planed. High pressure decorative laminate with high density fiberboard (HDF) crossbands.
   8. Thickness: 1-3/4 inch.

B. Solid Core High Pressure Decorative Laminate (HPDL) Flush Doors with Glazed Lites:
   1. Match appearance grade and applicable construction and performance requirements of other laminate finish flush wood doors.
   2. Factory Glazing: Refer to Section 08 8000 "Glazing" for glass view panels in flush wood doors. Factory install glass in fire rated doors only. Fill glazing bead nail holes in factory finished doors.
   3. Wood Glazing Accessories: Solid wood in matching species to face veneer in standard profile selected by Architect.

2.03 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.

C. Fit door edge trim to edge of stiles after applying veneer facing.

D. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

E. Openings: Cut and trim openings through doors in factory.
   1. Light Openings: Trim openings with moldings of material and profile indicated.
   2. Glazing: Comply with applicable requirements in Division 08 Section "Glazing."

F. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

G. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

1. Exception: Doors to be field finished.

H. Provide edge clearances in accordance with the quality standard specified.

2.04 ACCESSORIES

A. Hollow Metal Door Frames: As specified in Section 08 1113.

B. Glazing: As specified in Section 08 8000.

C. Glazing Stops: wood, of matching species to door facing, butted corners; prepared for countersink style tamper proof screws.

D. Door Hardware: As specified in Section 08 7100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

C. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.

D. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.05 SCHEDULE

A. Refer to Door Schedule on Drawings.

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies

B. Section 09 2216 - Non-Structural Metal framing

C. Section 09 9123 - Interior Painting: Field paint finish.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

D. Project Record Documents: Record actual locations of each access unit.

1.04 QUALITY ASSURANCE

A. Obtain Architect's approval for use of standard size units that vary slightly from indicated sizes.

B. Furnish inserts and anchoring devices to be built into other work.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Ceiling-Mounted Units:
   1. Location: As indicated on drawings.
   2. Panel Material: Aluminum.
   3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.02 CEILING-MOUNTED ACCESS UNITS

A. Manufacturers:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. ACUDOR Products Inc: www.acudor.com/#sle.
   3. Babcock-Davis: www.babcockdavis.com/#sle.
   4. Best Access Doors: www.bestaccessdoors.com/#sle.
   5. Elmdor: www.elmdor.com/#sle.
   6. Karp Associates, Inc; ____: www.karpinc.com/#sle.
   7. Nystrom, Inc; _____: www.nystrom.com/#sle.
   8. Substitutions: See Section 01 6000 - Product Requirements.

B. Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Door Style: Single thickness with rolled or turned in edges.
   2. Door Panels to Receive Wall/Ceiling Finish: Surface recessed 5/8 inch back from wall face.
   3. Aluminum Finish: Powder paint White.
   4. Door/Panel Size: As indicated on the drawings.
   5. Hardware:
      a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 3613
SECTIONAL DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead sectional doors, electrically operated.

B. Operating hardware and supports.

C. Electrical controls.

1.02 RELATED REQUIREMENTS

A. Section 03 4100 - Precast Concrete and Wall Panels

B. Section 06 1000 - Rough Carpentry: Rough wood framing for door opening.

C. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

D. Section 26 0583 - Wiring Connections.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

B. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

C. DASMA 102 - American National Standard Specifications for Sectional Doors; 2018.

D. NEMA MG 00001 - Motors and Generators; 2024.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

C. Product Data: Show component construction, anchorage method, and hardware.

D. Certificates: Products shall comply with Build America, Buy America Act requirements (BABAA)
   1. Certification of domestic origin
   2. Component breakdown (if manufactured product)
   3. Documentation prior to procurement

E. Samples:
   1. Submit two panel finish samples, 3x3 inch in size, illustrating color and finish.

F. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.

G. Operation Data: Include normal operation, troubleshooting, and adjusting.

H. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience.

C. Conform to applicable code for motor and motor control requirements.

D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for electric motor and transmission.

D. Provide five year manufacturer warranty for electric operating equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sectional Doors - Basis of Design: Clopay Energy Series with Intellicore, Model 3722.
   1. Other Acceptable Manufacturers:
      a. Raynor: www.raynor.com/products/commercial.cfm
      b. C.H.I. Overhead Doors: www.chiohd.com.
      c. Overhead Door: www.overheaddoor.com

2.02 DOOR COMPONENTS

A. Steel Doors: Flush steel, insulated with solid and glazed panels; low headroom lift, standard lift, or high lift operating style with track and hardware as indicated on drawings; complying with DASMA 102 Commercial application.
   1. Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
   2. Door Nominal Thickness: 2 inches thick.
   3. Spring Life Cycle- Minimum 50,000 cycles
   4. Air Leakage Rate: Less than 0.40 cfm/sf when tested in accordance with ASTM E283 at test pressure difference of 1.57 psf.
   5. Exterior Finish: Factory finished with acrylic baked enamel; Color: Black, provide sample for verification.
   6. Interior Finish: Factory finished with acrylic baked enamel; Color: As selected from manufacturer's standard range, provide sample for verification.
   7. Glazed Lights: Full panel width, Two rows; set in place with resilient glazing channel. Refer to door elevations in drawings.
   8. Operation: Operator.
   9. Sectional Overhead Door R-Value: 17.4 (Minimum)
   10. Door Panels: Steel construction; outer steel sheet of 20 gage, 0.0359 inch minimum thickness, flush profile; inner steel sheet of 27 gage, 0.0164 inch minimum thickness, flat profile; core reinforcement sheet steel roll formed to channel shape, rabbeted weather joints at meeting rails; polyurethane insulation.

B. Glazing: Fully tempered glass; insulated; tinted; 1/2 inch thick.

2.03 STEEL DOOR COMPONENTS

A. Track: Rolled galvanized steel, minimum thickness; wide, continuous one piece per side; galvanized steel mounting brackets thick.

B. Track: Galvanized steel angles, 0.094 inch minimum thickness; 3 inch size, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick.

C. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.

D. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.
   1. For Manual Operation: Requiring maximum exertion of 25 lbs force to open.

E. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.

F. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.

G. Head Weatherstripping: EPDM rubber seal, one piece full length.

H. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.

2.04 STEEL DOOR MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G60/Z180 coating, plain surface.

B. Float Glass: Provide float glass glazing, unless noted otherwise.
   1. Heat-Strengthened and Fully Tempered Types: ASTM C1048.

C. Insulation: Foamed-in-place polyurethane, bonded to facing.

2.05 STEEL DOOR ELECTRICAL OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by a testing agency acceptable to authorities having jurisdiction.

B. Electrical Characteristics:
   1. Mounting: Side mounted on cross head shaft.
   2. 3/4 hp; manually operable in case of power failure, transit speed of 12 inches per second.
   3. 115 volts, single phase, 60 Hz.
   4. Refer to Section 26 0583 for electrical connections.

C. Motor: NEMA MG 1, Type 1.

D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.

E. Disconnect Switch: Factory mount disconnect switch in control panel.

F. Electric Operator: Side mounted on cross head shaft, adjustable safety friction clutch; brake system actuated by independent voltage solenoid controlled by motor starter; enclosed gear driven limit switch; enclosed magnetic cross line reversing starter; mounting brackets and hardware.

G. Safety Edge: At bottom of door panel, full width; electro-mechanical sensitized type, wired to stop door upon striking object; hollow neoprene covered to provide weatherstrip seal.

H. Control Station: Standard three button (open-close-stop) momentary type control for each electric operator.
   1. 24 volt circuit.
   2. Surface mounted.
   3. Locate at inside door jamb. Coordinate with Architect.

I. Hand Held Transmitter: Digital control, resettable. Furnish two (2) per door. Coordinate push-button configuration with Architect prior to purchasing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

B. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION

A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.

3.03 INSTALLATION

A. Install door unit assembly in accordance with manufacturer's instructions.

B. Anchor assembly to wall construction and building framing without distortion or stress.

C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

D. Fit and align door assembly including hardware.

E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.04 TOLERANCES

A. Maximum Variation from Plumb: 1/16 inch.

B. Maximum Variation from Level: 1/16 inch.

C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.

D. Maintain dimensional tolerances and alignment with adjacent work.

3.05 ADJUSTING

A. Adjust door assembly for smooth operation and full contact with weatherstripping.

B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

3.06 CLEANING

A. Clean doors and frames.

B. Remove temporary labels and visible markings.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum doors and frames.

C. Weatherstripping.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

B. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.

C. Section 08 8000 - Glazing: Glass and glazing accessories.

D. Section 12 2400 - Window Shades: Attachments to framing members.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2026.

C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

E. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

F. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

G. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details .

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
   1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

D. Samples: Submit two samples 3 by3 inches in size illustrating finished aluminum surface, glass, glazing materials.

E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

G. Test Reports: Submit Reports from AAMA accredited laboratory certifying specified performance. Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable. Tests shall be no more than 3 years old.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide twenty year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

E. Warranty shall cover complete system for failure to meet specified requirements, including ability to exclude exterior moisture from interior, and shrinkage of thermal separation material.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Center-Set Style, Thermally-Broken:
   1. Basis of Design: Kawneer Company, Inc.; Trifab 451UT: www.kawneer.com.
   2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

2.02 BASIS OF DESING - FRAMING FOR NON-INSULATING GLAZING

A. Center-Set Sstyel, Not Thermally-Broken
   1. Basis of Design: Kawneer Company, Inc.; Trifab versaGlaze 450: www.kawneer.com
   2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep (50 mm wide by 152 mm deep).

B. Substitutions: See Section 01 6000 - Product Requirments.

2.03 BASIS OF DESIGN -- SWINGING DOORS FOR INSULATED GLAZING

A. Wide Stile, Insulating Glazing, Thermally-Broken:
   1. Basis of Design: Kawneer Company, Inc; 500T Swing Door: www.kawneer.com.
   2. Thickness: 2-1/4 inches.
   3. 1" insulated Glazing

B. Substitutions: See Section 01 6000 - Product Requirements.

2.04 BASIS OF DESIGN - SWINGING DOORS FOR NON-INSULATED GLAZING

A. Wide Stile, Monolithic Glazing:
   1. Basis of Design: Kawneer Company, Inc.; 500 Swing Door: www.kawneer.com

2. Thickness: 1-3/4" inches (43mm)
3. 1/4" glazing

B. Substitutions: See Section 01 6000 - Product Requirements.

2.05 MANUFACTURERS

A. Aluminum-Framed Storefront and Doors:
1. Kawneer North America: www.kawneer.com.
2. Oldcastle BuildingEnvelope: www.oldcastlebe.com.
3. Tubelite, Inc: www.tubeliteinc.com.
4. YKK AP America Inc; _____: www.ykkap.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.06 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
1. Finish: Class I natural anodized at exterior, Class II natural anodized at interior.
a. Factory finish all surfaces that will be exposed in completed assemblies.
b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
2. Finish Color: As indicated on drawings.
3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements:
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 10 psf.
3. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
4. When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.36 for total framing and glazing assembly.

2.07 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.

1. Glazing Stops: Flush.

B. Glazing: As specified in Section 08 8000.

2.08 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Fasteners: Stainless steel.

C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.09 FINISHES

A. Class I Natural Anodized Finish at Exterior Frames: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Class II Natural Anodized Finish at Interior Frames: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.

C. Color: As indicated on drawings.

2.10 HARDWARE

A. Other Door Hardware: As specified in Section 08 7100.

B. Weatherstripping: Wool pile, continuous and replaceable; provide on all exterior doors.

C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all exterior doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Install hardware using templates provided.
   1. See Section 08 7100 for hardware installation requirements.

J. Install glass in accordance with Section 08 8000, using glazing method required to achieve performance criteria.

K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.

B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.

D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing furnished as part of storefront assembly.

E. Section 08 4413 - Glazed Aluminum Curtain Walls: Glazing furnished as part of wall assembly.

F. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2026).

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

E. ASTM C1036 - Standard Specification for Flat Glass; 2025.

F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2024.

I. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

J. GANA (GM) - GANA Glazing Manual; 2022.

K. GANA (LGRM) - Laminated Glazing Reference Manual; 2019.

L. GANA (SM) - GANA Sealant Manual; 2008.

M. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).

N. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

O. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

P. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2026.

1.04 DEFINITIONS

A. Sealed Insulating Glass Unit Surfaces:
   1. Surface 1: Exterior surface of outer lite.
   2. Surface 2: Interspace-facing surface of outer lite.
   3. Surface 3: Interspace-facing surface of inner lite.

4. Surface 4: Interior surface of inner lite.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Insulating Glass Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Samples: Submit two samples 12 by 12 inch in size of glass units, other than monolithic clear float glass.

E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.07 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Insulating glass units.
   1. Furnish manufacturer's warranty, agreeing to furnish replacement insulating glass units identical to the original, for insulating units found defective within 10 years after Substantial Completion.

C. Coated glass units.
   1. Furnish manufacturer's warranty, agreeing to furnish replacement insulating glass units identical to the original, for insulating units found defective within 10 years after Substantial Completion.
   2. Defects include peeling, cracking, and other damage and deterioration of the coating, except where caused by breakage. Replacement units shall be delivered to the site without cost to the Owner.

D. Installer's Warranty: Furnish installer's warranty, agreeing to replace glazing units and accessories that deteriorate or are damaged due to faulty installation within 2 years after Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Float Glass Manufacturers:
   1. AGC Glass North America, Inc: www.agcglass.com.
   2. Cardinal Glass Industries: www.cardinalcorp.com.
   3. Guardian Glass, LLC: www.guardianglass.com.
   4. Pilkington North America Inc: www.pilkington.com/na.
   5. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com.

6. Viracon
7. Oldcastle Building Envelope
8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass without failure, including loss or glass breakage resulting from defective manufacture, fabrication, or installation; failure of glazing systems to remain watertight and airtight; or deterioration of glazing materials.
   1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   3. Glass thicknesses listed are minimum.

B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
   5. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.04 BASIS OF DESIGN - INSULATING GLASS UNITS

A. Basis of Design - Insulating Glass Units: Vision glazing, with Low-E coating.
   1. Applications: Exterior insulating glass glazing unless otherwise indicated.
   2. Space between lites filled with argon.
   3. Total Thickness: 1 inch.
   4. Thermal Transmittance: When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.38 for total framing and glazing assembly.
   5. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   6. Edge: Warm edge, stainless steel. Finish: Mill.
   7. Spacer Color: Black.
   8. Basis of Design - IG-01 Viracon Glass https://www.viracon.com/.
      a. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
         1) Low-E Coating: VE3-2M on #2 surface.
         2) Glass Tint: Gray HS.
      b. Inboard Lite: Annealed float glass, 1/4 inch thick.
         1) Glass: Clear.

c. Visible Light Transmittance (VLT): 35%
d. Solar Heat Gain Coefficient (SHGC): 0.25
e. Exterior Reflectance: 6%

9. Basis of Design - IG-02 Spandrel Viracon Glass https://www.viracon.com/.
   a. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
      1) Low-E Coating: VE3-2M on #2 surface.
      2) Glass Tint: Gray HS.
   b. Inboard Lite: Fully tempered float glass, 1/4 inch thick.
      1) Glass: Clear.
      2) Coating: V952 Warm Gray Viraspan on #4 surface.
   c. Exterior Reflectance: 6%

2.05 GLAZING UNITS

A. Type GL-01 - Monolithic Interior Vision Glazing:
   1. Applications: Interior glazing unless otherwise indicated. For applications up to 5'-0" in height.
   2. Glass Type: Annealed float glass, Fully-Tempered where indicated and where required by code.
   3. Tint: Clear.
   4. Thickness: 1/4 inch, nominal.

2.06 GLAZING COMPOUNDS

A. Manufacturers:
   1. BASF Corporation: www.basf.com.
   2. Bostik Inc: www.bostik-us.com.
   3. Dow Corning Corporation: www.dowcorning.com/construction.
   4. Momentive Performance Materials, Inc: www.momentive.com.
   5. Pecora Corporation: www.pecora.com.
   6. Tremco Commercial Sealants & Waterproofing; Proglaze SSG: www.tremcosealants.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.07 ACCESSORIES

A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal, black color; widths required for specified installation, and complying with AAMA 800.

D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Clean glass and adjacent surfaces after sealants are fully cured.

C. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 08 8300
MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass mirrors.
   1. Laminated safety glass.

1.02 RELATED REQUIREMENTS

A. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Metal mirror frames.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

D. ASTM C1036 - Standard Specification for Flat Glass; 2025.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

G. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.

H. GANA (GM) - GANA Glazing Manual; 2022.

I. GANA (SM) - GANA Sealant Manual; 2008.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds: Submit chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Manufacturer's Certificate: Certify that mirrors, meets or exceeds specified requirements.

E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.

B. Fabricate, store, transport, receive, install, and clean mirrors in accordance with manufacturer's recommendations.

1.06 FIELD CONDITIONS

A. Do not install mirrors when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Mirrors:
   1. Binswanger Mirror/ACI Distribution; Gym Mirrors: www.binswangerglass.com.
   2. Dreamwalls by Gardner Glass Products; Gym Mirrors: www.dreamwalls.com.
   3. Walker Glass Company Ltd; Gym Mirrors: www.walkerglass.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

B. Mirror Glass: Clear, Laminated safety glass, with copper and silver coatings, and protective overcoating.
   1. Thickness: 1/4 inch.
   2. Edges: Beveled.
   3. Size: As indicated on drawings.

2.03 ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness.

C. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; on release paper.

D. Glazing Clips: Manufacturer's standard type.

E. Mirror Attachment Accessories: Stainless steel J-profile channels.

F. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.
   1. Application Temperature: Minus 35 to 140 degrees F at contact surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for mirrored glazing are correctly sized and within tolerance.

B. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous mirror frames or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.

C. Prepare installation in accordance with ASTM C1193 for solvent release sealants, and install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install mirrors in accordance with manufacturer's recommendations.

B. Set mirrors plumb and level, and free of optical distortion.

C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

3.04 CLEANING

A. Remove wet glazing materials from finish surfaces.

B. Remove labels after work is complete.

C. Clean mirrors and adjacent surfaces.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Acoustic insulation.

C. Cementitious backing board.

D. Gypsum wallboard.

E. Joint treatment and accessories.

F. Acoustic (sound-dampening) wall board.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.

C. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

D. Section 09 2216 - Non-Structural Metal Framing.

E. Section 10 2641 - Ballistics Resistant Panels

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - Specifications for the Installation of Ceramic Tile; 2020.

B. ANSI A108/A118/A136.1 - Specifications for the Installation of Ceramic Tile; 2020.

C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

D. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

G. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.

H. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

I. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

J. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2024.

K. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2025.

L. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

M. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

N. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com.
   4. National Gypsum Company: www.nationalgypsum.com.
   5. PABCO Gypsum: www.pabcogypsum.com.
   6. Temple-Inland Building Product by Georgia-Pacific, LLC: www.temple.com.
   7. USG Corporation: www.usg.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Thickness:
      a. Vertical Surfaces: 5/8 inch.
      b. Ceilings: 5/8 inch.
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   3. Paper-Faced Products:
      a. American Gypsum Company; LightRoc Gypsum Wallboard.
      b. American Gypsum Company; FireBloc Type X Gypsum Wallboard.
      c. Georgia-Pacific Gypsum; ToughRock.
      d. Georgia-Pacific Gypsum; ToughRock Fireguard X.
      e. Temple-Inland Building Product by Georgia-Pacific, LLC; Gypsumboard and Gypsum Board Fire Resistant Panels Type X and Type TGC.
      f. Substitutions: See Section 01 6000 - Product Requirements.
   4. Mold Resistant Paper Faced Products:
      a. American Gypsum Company; M-Bloc.
      b. Georgia-Pacific Gypsum; ToughRock Mold-Guard.
      c. Temple-Inland Building Product by Georgia-Pacific, LLC; ComfortGuard Mold Resistant Gypsum Board.
      d. Substitutions: See Section 01 6000 - Product Requirements.

C. Backing Board For Wet Areas: One of the following products:
   1. Application: Surfaces behind tile in wet areas including restrooms.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
      a. Thickness: 5/8" inch.
      b. Products:
         1) Custom Building Products: www.custombuildingproducts.com.
         2) USG Corporation: www.usg.com.
         3) Substitutions: See Section 01 6000 - Product Requirements.
   4. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
      a. Fire Resistant Type: Type X core, thickness 5/8 inch.
      b. Products:
         1) Georgia-Pacific Gypsum; DensShield Tile Backer.

2) National Gypsum Company; Gold Bond eXP Tile Backer.

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 5/8 inch.
   3. Edges: Tapered.
   4. Products:
      a. Georgia-Pacific Gypsum; ToughRock Span 24 Ceiling Board.
      b. Temple-Inland Building Products by Georgia-Pacific, LLC; Span24 Ceiling Board.
      c. Substitutions: See Section 01 6000 - Product Requirements.

E. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
   2. Edges: Tapered.
   3. Products:
      a. American Gypsum Company; Exterior Soffit Gypsum Wallboard Type X.
      b. Continental Building Products; Soffitboard.
      c. Continental Building Products; Soffitboard Type X.

2.02 ACCESSORIES

A. Acoustic Insulation: As specified in Section 07 2100.

B. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
   3. Products:
      a. Same manufacturer as framing materials.
      b. Phillips Manufacturing Co: www.phillipsmfg.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Ready-mixed vinyl-based joint compound.
   3. Powder-type vinyl-based joint compound.
   4. Chemical hardening type compound.

D. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

E. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
   1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
   2. Install studs at spacing required to meet performance requirements.

3.03 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

E. Cementitious Backing Board: Install over steel framing members where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 2216
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal partition, ceiling, and soffit framing.

B. Framing accessories.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Requirements for structural, load-bearing, metal stud framing and exterior wall stud framing.

B. Section 06 1000 - Rough Carpentry: Wood blocking within stud framing.

C. Section 07 2100 - Thermal Insulation: Acoustic insulation.

D. Section 07 8400 - Firestopping: Sealing top-of-wall assemblies at fire-resistance-rated walls.

E. Section 09 2116 - Gypsum Board Assemblies: Execution requirements for anchors for attaching work of this section.

1.03 REFERENCE STANDARDS

A. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2024.

B. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

D. ASTM E413 - Classification for Rating Sound Insulation; 2022.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

B. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich: www.clarkdietrich.com.
   2. Jaimes Industries: www.jaimesind.com.
   3. SCAFCO Corporation: www.scafco.com.
   4. Steel Construction Systems: www.steelconsystems.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FRAMING MATERIALS

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Studs: C shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

B. Partition Head to Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and braced with continuous bridging on both sides.

C. Non-Loadbearing Framing Accessories:
   1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
   2. Acoustic Insulation: As specified in Section 07 2100.
   3. Acoustic Sealant: As specified in Section 09 2116.

2.03 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING

A. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

B. Align and secure top and bottom runners at 24 inches on center.

C. At partitions indicated with an acoustic rating:
   1. Provide components and install as required to produce STC ratings as indicated, based on published tests by manufacturer conducted in accordance with ASTM E90 with STC rating calculated in accordance with ASTM E413.
   2. Place one bead of acoustic sealant between runners and substrate, studs and adjacent construction.
   3. Place one bead of acoustic sealant between studs and adjacent vertical surfaces.

D. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

E. Install studs vertically at spacing indicated on drawings.

F. Align stud web openings horizontally.

G. Secure studs to tracks using crimping method. Do not weld.

H. Fabricate corners using a minimum of three studs.

I. Install double studs at wall openings, door and window jambs, not more than 2 inches from each side of openings.

J. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.

K. Furring: Install at spacing and locations shown on drawings. Lap splices a minimum of 6 inches.

3.03 CEILING AND SOFFIT FRAMING

A. Install framing after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

B. Install furring independent of walls, columns, and above-ceiling work.

C. Securely anchor hangers to structural members or embed them in structural slab. Space hangers as required to limit deflection to criteria indicated.

D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.

E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

F. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.

G. Laterally brace suspension system.

3.04 TOLERANCES

A. Maximum Variation From True Position: 1/8 inch in 10 feet.

B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for wall applications.

B. Cementitious backer board as tile substrate.

C. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 03 5400 - Cast Underlayment.

B. Section 07 1400 - Fluid-Applied Waterproofing.

C. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

D. Section 07 9513 - Expansion Joint Cover Assemblies: Expansion joint components.

E. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2023.

B. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.

E. ANSI A108.5 - Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry-Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar; 2023.

F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 2023.

G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2024).

H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2023.

I. ANSI A108.10 - Installation of Grout in Tilework; 2026.

J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.

K. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).

L. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.

M. ANSI A118.1 - American National Standard Specifications for Dry-Set Cement Mortar; 2023.

N. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.

O. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.

P. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.

Q. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.

R. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

S. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.

T. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).

U. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2012.

V. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).

W. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

X. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2026.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one (full size) sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Maintenance Materials: Furnish the following for the owner's use in maintenance of the project.
      a. Extra Tile: 2%
      b. See Section 01 6000 Product Requirements
   3. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

E. Maintain one copy of and ANSI A108/A118/A136 and TCNA (HB) on site.

1.06 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products of each type by the same manufacturer.
   1. Virginia Tile: www.virginiatile.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Porcelain Tile: ANSI A137.1 standard grade.
   1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
   2. Size: As indicated on drawings.
   3. Edges: Square.
   4. Surface Finish: Matte and Po
   5. Color(s): As indicated on drawings.
   6. Pattern: As indicated on drawings..

2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications:
      a. As indicated on drawings
   2. Manufacturers:
      a. Schluter-Systems: www.schluter.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 SETTING MATERIALS

A. Manufacturers: All installation products by the same manufacturer.
   1. LATICRETE International, Inc: www.laticrete.com.
      a. Manufacturer to Provide 25 Year Warranty.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
   1. Products:
      a. LATICRETE International, Inc; LATICRETE 254 Platinum Plus: www.laticrete.com/#sle.
      b. LATICRETE International, Inc; 3701 Fortified Mortar Bed: www.laticrete.com/#sle.
      c. LATICRETE International, Inc; LATICRETE Multimax: www.laticrete.com/#sle.
      d. Substitutions: See Section 01 6000 - Product Requirements.

C. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
   1. Products:
      a. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 GROUTS

A. Manufacturers:
   1. LATICRETE International, Inc: www.laticrete.com/.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Provide grout made by the same manufacturer as setting materials to meet manufacturers 25 year system warranty.

C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Color(s): As indicated on drawings.
   2. Products:
      a. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
   1. Applications: Between tile and plumbing fixtures.
   2. Color(s): As selected by Architect from manufacturer's full line.
   3. Products:
      a. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

B. Provide maintenance materials by the same manufacturer as setting materials to meet manufacturers 25 year system warranty.

2.06 ACCESSORY MATERIALS

A. Concrete floor and wall Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Anti-Fracture Membrane shall be installed vertically and horizontally behind all tiled surfaces.
   2. Type: Fluid-applied.
   3. Thickness: 20 mils, maximum.
   4. Crack Resistance: No failure at 1/16 inch gap, minimum.
   5. Products:
      a. LATICRETE International, Inc; HydroBan XP: www.laticrete.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

B. Underlayment:
   1. Products:
      a. LATICRETE International, Inc; NXT Level Plus: www.laticrete.com.
      b. Substitutions: See Section01 6000-Product Requirements

C. Primer:
   1. Products:
      a. LATICRETE International, Inc; LATICRETE HYDRO BAN Sheet Membrane: www.laticrete.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

D. Waterproofing Membrane: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
   1. Fluid or Trowel Applied Type:
      a. Products:
         1) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
         2) Substitutions: See Section 01 6000 - Product Requirements.

E. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 5/8 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

F. Accessory materials by the same manufacturer as setting materials to meet manufacturers 25 year system warranty.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

B. Verify that required wall-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Install control joints in accordance with TCNA Method EJ-171. Review location with Architect prior to installation.

C. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base, and wall joints.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

F. Form internal angles square and external angles bullnosed.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Sound tile after setting. Replace hollow sounding units.

I. Keep control and expansion joints free of mortar, grout, and adhesive.

J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

K. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

L. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - WALL TILE

A. Over cementitious backer units install in accordance with TCNA (HB) Method W223.

3.05 CLEANING

A. Clean tile and grout surfaces.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 21 1300 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.

C. Section 23 3700 - Air Outlets and Inlets: Air diffusion devices in ceiling.

D. Section 26 5100 - Interior Lighting: Light fixtures in ceiling system.

E. Section 27 5116 - Public Address Systems: Speakers in ceiling system.

F. Section 28 1300 - Access Control and Security System: Security system components in ceiling system.

G. Section 28 4600 - Fire Detection and Alarm: Fire alarm components in ceiling system.

1.03 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Indicate locations, grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
   3. Samples for Verification:
      a. Samples: Submit two samples [6 by 6] inch in size illustrating material and finish of acoustical units.
      b. Samples: Submit two samples each, 4 inches long, of suspension system main runner, cross runner, and perimeter molding.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.

2. Installers Qualification Statement
    a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements

D. Submittals for Project Closeout
1. Operation and Maintenance Data
    a. See Section 01 7000 Execution and Closeout Requirements
2. Maintenance Materials: Furnish the following for the owner's use in maintenance of the project.
    a. Extra 5%
    b. See Section 01 6000 Product Requirements
3. Warranty
    a. Acknowledge warranty duration and scope covered by warranty.

1.06 QUALITY ASSURANCE

A. Manufacturers Qualifications
1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
2. See Section 01 4000 – Quality Requirements

C. Sourcing
1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.07 WARRANTY

A. Manufacturers Warranty
1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.09 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:

1. Armstrong World Industries, Inc: www.armstrongceilings.com.
2. USG Corporation: www.usg.com/ceilings.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Suspension Systems:
1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.
1. VOC Content: As specified in Section 01 6116.

B. Acoustical Tiles (ACT-1) USG MARS ACOUSTICAL PANELS : Painted mineral fiber, with the following characteristics:
1. Classification: ASTM E1264 Type III.
2. Size: 24 by 24 inches.
3. Thickness: 3/4 inch.
4. NRC Range: .75 to .85, determined in accordance with ASTM E1264.
5. Ceiling Attenuation Class (CAC): .35, determined in accordance with ASTM E1264.
6. Tile Edge: Shadowline Tapered.
7. Color: As indicated on drawings.

C. Acoustical Tiles (ACT-2) USG MARS HIGH-NRC/HIGH-CAC ACOUSTICAL PANELS: Painted mineral fiber, with the following characteristics:
1. Classification: ASTM E1264 Type III.
2. Size: 24" x 24"
3. Thickness: 1"
4. NRC Range: .80 to .85, determined in accordance with ASTM E1264.
5. Ceiling Attenuation Class (CAC): .40, determined in accordance with ASTM E1264.
6. Tile Edge: Shadowline Tapered
7. Color: As indicated on drawings.

2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

B. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
2. Profile: Tee; 15/16 inch face width.
3. Finish: As indicated on drawings.
4. Products:
a. USG Corporation; Donn Brand DX/DXL 15/16 inch Acoustical Suspension System: www.usg.com/ceilings.
b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same metal and finish as grid.
1. Size: As required for installation conditions.
2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
3. Channel Molding: U-shaped, for hold-down type installations.

C. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

G. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

H. Do not eccentrically load system or induce rotation of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.
   2. Field paint exposed reveal edges.

F. Install hold-down clips on panels within 20 ft of an exterior door.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6566
RESILIENT ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rubber sheet flooring, adhesively installed.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 3000 - Cast-in-Place Concrete

C. Section 03 5400 - Cast Underlayment.

D. Section 09 0561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

E. Section 09 0561 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

F. Section 09 6500 - Resilient Flooring.

1.03 REFERENCE STANDARDS

A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers 1998 (Reapproved 2015).

B. ASTM E2179 - Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors 2003 (Reapproved 2016).

C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

D. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine 2009, with Editorial Revision (2016).

E. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).

F. ASTM F1859 - Standard Specification for Rubber Sheet Floor Covering Without Backing 2014, with Editorial Revision (2016).

G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2019.

H. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

I. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

J. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

K. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

L. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

M. ASTM F2772 - Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems; 2024.

N. CHPS (HPPD) - High Performance Products Database; Current Edition.

O. DIN EN 14904 - Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use – Specification; 2006.

P. SCS (CPD) - SCS Certified Products; Current Edition.

Q. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans and details as required to outline size, finish, seam location and installation of all products in every location/application. Submit with 9 6500 Resilient Flooring and 09 6913 Tile Carpeting.
   3. Samples for Verification:
      a. Submit one (6"x6") sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturer's Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 PREFORMED ATHLETIC FLOORING

A. Manufacturers:
   1. Ecosurfaces: www.ecosurfaces.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Materials (RB-1): As indicated on drawings.
   1. Product: As indicated on drawings.
   2. Roll Size: As indicated on drawings.
   3. Color: As indicated on drawings.
   4. Pattern: As indicated on drawings.

C. Performance Minimum Requirements:
   1. Tensile Strength (ASTM D412): >200 PSI
   2. Static Load Limit (ASTM F970): 0.004" (@400psi)
   3. VOC Compliant (ASTM D5116): Yes
   4. Color Stability (ASTM F1515): Good
   5. Chemical Resistance (ASTM F925): Excellent
   6. Abrasion Resistance (ASTM D3389): <1g, 100 cycles
   7. Behavior to Fire (ASTM E648): Class 1
   8. Coefficient of Friction (COF) (ASTM D2047): >0.6

D. Welding Rod: Produced by manufacturer of rubber flooring for heat welding seams, in color matching field color.

2.02 ACCESSORIES

A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.

B. Flooring Primers, Adhesives and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. General Contractor will notify the flooring installation company to proceed with the installation after concrete slab specifications are met.

E. Installer shall perform tests for moisture and adhesion prior to application and report adverse conditions to the general contractor in writing.

F. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

G. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

C. Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/8 inch within 10 ft radius.

D. Prohibit traffic until filler is fully cured.

E. Broom clean areas to receive athletic flooring immediately before beginning installation.

3.03 INSTALLATION - PREFORMED ATHLETIC FLOORING

A. Install in accordance with manufacturer's instructions.

B. Spread only enough adhesive to permit installation of materials before initial set.

C. Set flooring in place, press with heavy roller to attain full adhesion.

D. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.

E. Cut sheet at seams in accordance with manufacturer's instructions.

F. Seal seams by heat welding as required.

G. Double cut sheet; provide heat welded seams.

H. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.

I. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure resilient strips with adhesive.

J. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

K. Install flooring in recessed floor access covers, maintaining floor pattern.

3.04 CLEANING

A. Clean flooring using methods recommended by manufacturer.

B. Remove excess adhesive from floor, base, and wall surfaces without damage.

3.05 PROTECTION

A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Completion.

B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 6700
FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied flooring and wall base.

B. Divider Strips & Accessories

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

B. Section 22 1006 - Plumbing Piping Specialties: Recessed plumbing access cover frames.

C. Section 26 0526 - Grounding and Bonding for Electrical Systems: Grounding and bonding of conductive flooring to building grounding system.

1.03 REFERENCE STANDARDS

A. ANSI/ESD STM7.1 - Standard Test Method for the Protection of Electrostatic Discharge Susceptible Items Flooring Systems Resistive Characterization; 2020.

B. ASTM D905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008 (Reapproved 2021).

C. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2025.

D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

E. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.

F. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

G. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

H. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one (4"x4") sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Testing Reports
      a. Certified test data from an independent testing agency verifying that products meet or exceed specified requirements.
   2. Manufacturer's Qualification Statement

a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.

3. Installers Qualification Statement
    a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
1. Operation and Maintenance Data
    a. See Section 01 7000 Execution and Closeout Requirements
2. Warranty
    a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
2. See Section 01 4000 – Quality Requirements

C. Testing Agency Qualifications
1. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
2. See Section 01 4000 – Quality Requirements

D. Sourcing
1. Single Source Responsibility: Provide and install this work from a single fabricator.

E. Sequencing
1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
1. Provide manufacturer's standard one year written warranty against defects in materials.

B. Installation Warranty
1. Provide installer's standard written one year warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply witih requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturer's written instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturers absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fluid-Applied Flooring
   1. Basis of design: Stonhard: www.stonhard.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring: Epoxy base coat(s), polyurethane top coat, with aggregate. All system components shall be by the same manufacturer.

B. Basis of Design Product (RS-1): Stonhard Stonshield URT with Stonseal SK6 topcoat; System must include 1/8" troweled epoxy layer prior to broadcasting of quartz.
   1. Thickness: 1/8 inch, nominal, when dry.
   2. Primer:
      a. Material Basis: Stonhard Quik Primer
      b. Resin: Aromatic urethane
      c. Formulation Description: (2) two component , 100 percent solids
      d. Application Method: Squeegee and roller
      e. Number of Coats: (1) one
   3. Broadcast Media:
      a. Material Basis; Stonshield quartz aggregate
      b. Type: Pigmented
      c. Finish: Standard
      d. Number of Coats: One
      e. Pattern: Tweed
   4. Undercoat:
      a. Material Basis: Stonshield URT Undercoat
      b. Resin: Urethane
      c. Formulation Description: (2) two component, solvent free, UV resistant, Aliphatic Urethane
      d. Type: Clear
      e. Number of Coats: One
   5. Broadcast Media:
      a. Material Basis: Stonshield quartz aggregate
      b. Type: Pigmented
      c. Finish: Standard
      d. Number of Coats: One
      e. Pattern: Tweed
   6. Sealer:
      a. Material Basis: Stonseal CA7
      b. Resin: Eurethane
      c. Formulation Description: (2) two component, solvent free, UV resistant, aliphatic urethane
      d. Type: Clear
      e. Finish: Gloss
      f. Number of Coats: One
      g. Texture: As indicated on drawings
   7. Color: As indicated on drawings.
   8. Integral Cove Base:
      a. Material Basis: Troweled Stonshield Cove Base
      b. As Indicated on drawings
   9. Transition Accessories: As indicated on drawings.

2.03 ACCESSORIES

A. Integral Cove Base: Stonshield 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 top coating of cove base. Round internal and external corners. Provide zinc metal cove termination strip. Refer to drawings for locations and height.

B. Moisture Mitigation: Type recommended and produced by resinous flooring manufacturer. Install in areas where moisture vapor emission exceeds allowable rates for specified flooring. Install Stonfil OP2, a 3-component, polymer modified grout, or Primer 150, a two-component, high-solids, moisture mitigating epoxy primer.

C. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated. Allowances to be made for Stonset TG5.

D. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances to be made for Stonflex MP7 joint filler and Stonproof CT5 crack treatment.

E. Divider Strips: 1/4 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip, with anchoring features

F. Control Joints: Backer rod and color match joint sealant, locate in line with the engineered designed joints.

G. Sealer: Colorless, non-yellowing, penetrating liquid type to completely seal matrix surface; not deterimental to resinous flooring components and as recommended by resinous flooring manufacturer. Sealers shall comply with the following:
   1. Comply with ASTM D 2047.

H. Glides and felt pads should be used on all table and chair legs, recommended diameter is 1-1/4" or greater.

PART 3 EXECUTION

3.01 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph 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. Mechanically prepare 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 recommendations.
   3. Verify that concrete substrates are dry.
      a. Perform in-situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 85 percent.
      b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 7 lb of water/1000 sq. ft. of slab in 24 hours.
      c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.

4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material.

3.02 APPLICATION

A. General: 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. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
      a. Apply joint sealant to comply with manufacturer's written recommendations.

B. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

C. Body Coat: apply metal trowel single mortar coat in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When cured, remove any surface irregularities by lightly abrading and vacuuming the floor surface.

D. Stonshield Undercoat: Mix and apply undercoat with strict adherence to manufacturer's installation procedures and coverage rates.

E. Stonshield Broadcast: Immediately broadcast quartz silica aggregate into the undercoat using manufacturer's specially designed spray-caster. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.

F. Apply grout coat, sealers, and topcoat(s) in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.03 TERMINATIONS

A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

D. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.04 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Vertical and horizontal contraction and expansion joints are treated by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.05 CLEANING, PROTECTING, AND CURING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 18 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer

3.06 INSTALLATION - ACCESSORIES

A. Install access panel recess frames.

B. Accurately saw cut substrate to install divider strips.

C. Install strips straight and level to locations indicated.

D. Feather fluid applied flooring to create a flush transition with dissimilar flooring materials and divider strips.

E. Install terminating cap strip at top of base; attach securely to wall substrate.

3.07 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness required by manufacturer.

C. Finish to smooth level surface.

D. Install with feathered thickness necessary for flush transitions adjacent to other flooring materials and transition strips.

E. Cove at vertical surfaces. Where indicated on drawings.

3.08 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 09 6813
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. CRI 104 - Standard for Installation of Commercial Carpet; 2018.

E. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2011.

F. AATCC 134 - Standard Test Method for Electrostatic Propensity of Carpets

G. ASTM E661 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

H. ASTM E662 - Standard Test Method for Smoke Density Test

I. 16 CFR Part 1630 - Methenamine Pill Test

J. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans and details as required to outline size, finish, and installation of all products in every location/application. Submit with 09 6500 Resilient Flooring and 09 6566 Resilient Athletic Flooring.
   3. Samples for Verification:
      a. Submit one (full size) sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data

a. See Section 01 7000 Execution and Closeout Requirements

2. Maintenance Materials: Furnish the following for the owner's use in maintenance of the project.
   a. Extra: 5%
   b. See Section 01 6000 Product Requirements
3. Warranty
   a. Acknowledge warranty duration and scope covered by warranty.

1.05 WARRANTY

A. Manufacturer's Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installer's Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.06 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Testing Agency Qualifications
   1. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
   2. See Section 01 4000 – Quality Requirements

D. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

E. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Mohawk Group: www.mohawkgroup.com

2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Carpet Tile Type WOC-1: As indicated on drawings, manufactured in one color dye lot.
   1. Product: As indicated on drawings
   2. Tile Size: As indicated on drawings
   3. Color: As indicated on drawings
   4. Pattern: As indicated on drawings.
   5. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E 648 or NFPA 253.
   6. VOC Content: Comply with Section 01 6116.

2.03 ACCESSORIES

A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within manufacturer required tolerances for that type of work and are ready to receive carpet tile.

B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet tile in accordance with manufacturer's instructions and CRI 104.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Locate change of color or pattern between rooms under door centerline.

F. Fully adhere carpet tile to substrate.

G. Trim carpet tile neatly at walls and around interruptions.

H. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 7200
WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation and prime painting.

B. Wall covering and borders.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Preparation and priming of substrate surfaces.

1.03 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020 (Reapproved 2025).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM F793/F793M - Standard Classification of Wall Coverings and Ceiling Coverings by Use Characteristics; 2025.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one Color Proof for approval prior to manufacture of a full size minature mural.
      b. Submit one full size maniature strike-off for approval prior to the manufacture of full size mural.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications

1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
2. See Section 01 4000 – Quality Requirements

C. Sourcing
1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
1. Provide manufacturer's standard 5 year written warranty against defects in materials.

B. Installation Warranty
1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

D. Store material in a flat position to prevent damage to roll-ends. Do not cross stack material. Support material off the floor in a manner to prevent sagging and warping.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

C. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

D. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 WALL COVERINGS

A. General Requirements:
1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

B. Wallcovering: Type II conforming to Federal Specification CCC-W-408A and WA-101-A using test methods given in Federal Specification CCC-T-191 b excepted as otherwise specified.
1. Comply with ASTM F793/F793M, Category V, Type II.
2. Total Thickness: 0.018 to 0.026 inches
3. Total Weight: 21 oz/sq yd
4. Roll Width: 54 inches.
5. Backing: Poly-Cotton Woven
6. Digital Image: Owner/Architect to provide PDF file of image to be digitally printed with UV inks on Koroseal Digital Surfaces Type II Wallcovering.
7. Manufacturers:
a. Koroseal Digial Surfaces Wallcoverings: www.koroseal.com.

b. Substitutions: See Section 01 6000 - Product Requirements.

C. Adhesives: As recommended by wall covering manufacturers

D. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

E. Substrate Primer and Sealer: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are prime painted and ready to receive work, and comply with requirements of wall covering manufacturer.

B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.

E. Marks: Seal with shellac those that may bleed through surface finishes.

F. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

G. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply adhesive to wall surface immediately prior to application of wall covering.

C. Use wall covering in roll number sequence.

D. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.

E. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

F. Butt edges tightly.

G. Overlap adjacent panels as recommended by manufacturer.

H. Horizontal seams are not acceptable.

I. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

J. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.

K. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

SECTION 09 8430
SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sound-absorbing ceiling units.

B. Mounting accessories.

1.02 RELATED REQUIREMENTS

A. Section 09 5100 - Acoustical Ceilings: Ceiling suspension system.

B. Section 09 9123 - Interior Painting.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

B. ASTM 413 - Classification for Rating Sound Transmission.

C. UL 723 - Test for Surface Burning Characteristics of Building Materials.

D. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

F. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one (custom size) sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.

2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard 20 year written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

C. Store and protect products in accordance with manufacturers' instructions.

D. Comply with manufacturer's warranty conditions when applicable

E. Protect edges from damage.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Field Measurements: Verify field measurements as indicated on Shop Drawings. Where measurements are not possible, provide control dimensions and templates.
   1. Coordinate installation and location of blocking and supports as requested.

D. Verify openings, clearances, storage requirements and other dimensions relevant to the installation and final application.

E. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.01 SOUND ABSORBING MATERIALS

A. Acoustic Baffles
   1. Acoufelt Beam
      a. Construction: Felt (100% Polyester)
      b. Profile: As indicated in drawings
      c. Length: As indicated in drawings
      d. NRC: 1.65
      e. Color: As indicated in drawings
      f. Installation: Suspended Baffles, Cable to T-grid

g. Flammability: Panel components shall have a Class “A” rating per ASTM E 84.

2.02 FABRICATION

A. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

B. Accessories
   1. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as indicated on each acoustical unit, sized appropriately for weight of acoustical unit.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Examine installation areas and mounting surfaces with Installer present, for compliance with manufacturer's installation tolerances including required clearances, floor level, location of blocking and anchoring reinforcements, and other existing conditions that may affect installation or performance.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Proceed with installation only after correction of unsatisfactory conditions.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. Measure each wall area and establish layout of acoustical wall units. Coordinate wall panel layout with mechanical and electrical fixtures.

C. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

3.03 INSTALLATION

A. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

B. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

C. Install manufactured units in accordance with manufacturer's recommendations, approved submittals, and in proper relationship with adjacent construction.

D. Clean exposed surfaces. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

3.04 INSTALLATION OF ACOUSTIC ROOM COMPONENTS

A. Install housings utilizing manufacturer's supplied brackets and fasteners recommended for application. Adjust upper and lower limits individually after installation.

B. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

C. Suspend ceiling baffles at locations and heights as indicated.

3.05 FIELD QUALITY CONTROL

A. Inspect installed work to verify compliance with requirements.
   1. Verify that HVAC work and electrical work complies with manufacturer's submittals and written installation requirements.
   2. Perform installation and startup checks as recommended by manufacturer.

3. Prepare inspection reports and submit to Architect.

3.06 CLEANING

A. Repair or replace defective work as directed by Architect upon inspection.

B. Clean surfaces. Touch up marred finishes, or replace damaged components that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by manufacturer.

3.07 CLEANING

A. Protect installed products from damage, abuse, dust, dirt, stain, or paint until completion of project. Do not permit use during construction.

B. Clean facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.08 PROTECTION

A. Provide protection of installed acoustical products until Date of Substantial Completion.

B. Replace products that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

D. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Exterior:
         1) Metal: Iron, structural iron and steel, ferrous metal.
      b. Interior:
         1) Metal: Overhead and vertical surfaces to be painted.
         2) Drywall: Walls, ceilings, gypsum board, and similar items.
         3) Concrete: Floors, vehicular.
   2. Do not paint or finish the following:
      a. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
      b. Items indicated to receive other finishes.
      c. Items indicated to remain unfinished.
      d. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
      e. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
      f. Marble, granite, slate, and other natural stones.
      g. Floors, unless specifically indicated.
      h. Ceramic and other tiles.
      i. Brick, architectural concrete, cast stone, integrally colored plaster, and stucco.
      j. Glass.
      k. Acoustical materials, unless specifically indicated.
      l. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 05 5000 - Metal Fabrications: Shop-primed items.

C. Section 07 1900 - Water Repellents.

D. Section 07 8123 - Intumescent Fire Protection.

E. Section 09 9600 - High-Performance Coatings.

F. Section 03 30 00 - Cast-in-Place Concrete.

G. Section 04 20 00 - Unit Masonry: Concrete Masonry Units (CMU) and brick.

H. Section 05 12 16 - Fabricated Fireproofed Steel Columns.

I. Section 05 50 00 - Metal Fabrications.

J. Section 06 20 00 - Finish Carpentry.

K. Section 06 40 00 - Architectural Woodwork.

L. Section 08 11 13.16 - Custom Hollow Metal Doors and Frames.

M. Section 09 21 16.23 - Gypsum Board Shaft Wall Assemblies.

N. Section 23 05 00 - Common Work Results for HVAC.

O. Section 26 05 00 - Common Work Results for Electrical.

1.03 REFERENCE STANDARDS

A. SSPC-SP5/NACE No. 1, White Metal Blast Cleaning.

B. SSPC-SP6/NACE No. 3, Commercial Blast Cleaning.

C. SSPC-SP7/NACE No. 4, Brush-Off Blast Cleaning.

D. SSPC-SP10/NACE No. 2, Near-White Blast Cleaning.

E. SSPC-SP11, Power Tool Cleaning to Bare Metal.

F. SSPC-SP12/NACE No. 5, Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Primer requirements and finish specification. Surface preparation instructions and recommendations.
   2. Shop Drawings: Include coating types by location and any special surfaces to be painted.
   3. Samples for Verification:
      a. Submit three paper draw down samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating color specified for each finishing product specified.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Maintenance Materials: Furnish the following for the owner's use in maintenance of the project.
      a. Extra: 1 Gallon of each color and a Custodian Manual indicating all products, colors. & sheens; including custom colors.
      b. See Section 01 6000 Product Requirements
   3. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated; www.sherwin-williams.com.

B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 6000 - Product Requirements, and the following:
   1. Products that meet or exceed performance and physical characteristics of basis of design products.
   2. Other Acceptable Manufacturers:
      a. PPG.
      b. Benjamin Moore.
      c. Substitutions: See Section 016000 - Product Requirements..

2.02 PAINTINGS AND COATINGS

A. General:
   1. Provide factory-mixed coatings unless otherwise indicated.
   2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
   3. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.

C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces and as recommended by manufacturer of top coat.

2.03 PAINT SYSTEMS - EXTERIOR

A. Metal - Overhead and Vertical surfaces to be painted:
   1. Color: As indicated on drawings.
   2. Sheen: As indicated on drawings.
      a. Alkyd Systems, Water Based:
         1) Primer and Top coat(s):
            (a) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com.
            (b) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com.

2.04 PAINT SYSTEMS - INTERIOR

A. Metal - Overhead and Vertical surfaces to be painted:
   1. Color: As indicated on drawings
   2. Sheen: As indicated on drawings
      a. Alkyd Systems, Water Based:
         1) Primer and Top coat(s):
            (a) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com.
            (b) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com.

B. Drywall -Overhead and Vertical surfaces to be painted: Walls, ceilings, gypsum board, and similar items.
   1. Color: As indicated on drawings
   2. Sheen: As indicated on drawings
      a. Latex Systems:
         1) Primer and Top coat(s):
            (a) 1st Coat: Sherwin-Williams ProMar 200 HP Zero VOC Interior Latex Primer, B20W01951: www.sherwin-williams.com.
            (b) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1950 Series: www.sherwin-williams.com.
      b. Epoxy Systems, Water Based:
         1) Primer and Top coat(s):
            (a) 1st Coat: Sherwin-Williams ProMar 200 HP Zero VOC Interior Latex Primer, B20W01951: www.sherwin-williams.com.
            (b) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com.

C. Concrete - Surfaces to be painted Floors, vehicular.
   1. Color: As indicated on drawings.
   2. Sheen: As indicated on drawings.
   3. Latex Systems:
      a. Top coat(s):
         1) 1st Coat: Sherwin Williams ArmorSeal 1000 HS Polyamide Epoxy, I67-C02000-WB: www.sherwinwilliams.com
         2) 2nd and 3rd Coats: Sherwin Williams ArmorSeal HS Polyurethane, I65-C00220-WC: www.sherwinwilliams.com

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been adequately prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Plaster and Stucco: 12 percent.
   3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Fill bug holes, air pockets, and other voids with cement patching compound.
   3. Clean concrete according to manufacurers instructions.
   4. Prepare surface as recommended by manufacturer.

G. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.

H. Concrete Floors and Traffic Surfaces: Prepare concrete in accordance with manufacturers recommendations.

I. Metal:
   1. Clean in accordance with manufacturers recommendations.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
   3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and protect from corrosion until coated.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

F. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

3.04 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 10 1400
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

B. Building identification signs.

C. Plaques.

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. ASTM E2072 - Standard Specification for Photoluminescent (Phosphorescent) Safety Markings; 2024.

D. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

E. UL 1994 - Luminous Egress Path Marking Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, colors and graphics.
   3. Samples for Verification:
      a. Submit one (full or sample size) sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.04 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications

1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
2. See Section 01 4000 – Quality Requirements

C. Sourcing
1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.05 WARRANTY

A. Manufacturers Warranty
1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

D. Store and protect products in accordance with manufacturers' instructions. Store tape adhesive at normal room temperature.

E. Comply with manufacturer's warranty conditions when applicable

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Identifaction Signs:
1. Best Sign Systems, Inc: www.bestsigns.com.
2. Cosco Industries (ADA signs); ADA Series 1: www.coscoarchitecturalsigns.com.
3. Gemini Signs: https://www.geminisignproducts.com
4. Indigo Signs: www.indigosigns.com
5. Inpro: www.inprocorp.com.
6. Mohawk Sign Systems, Inc: www.mohawksign.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

B. Dimensional Letter Signs:
1. Cosco Industries: www.coscoarchitecturalsigns.com.
2. FASTSIGNS: www.fastsigns.com.
3. Gemini Signs: https://www.geminisignproducts.com
4. Indigo Signs: www.indigosigns.com
5. Substitutions: See Section 01 6000 - Product Requirements.

C. Other Signs - Cut metal signage:
1. Gemini Signs: https://www.geminisignproducts.com.

2. Indigo Signs: www.indigosigns.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

D. Plaques:
1. FASTSIGNS: www.fastsigns.com/#sle.
2. Inpro: www.inprocorp.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
1. Sign Type: Flat signs with applied character panel media as specified.
2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
3. Sign Height: As indicated on drawings.
4. Room Doors: Identify with room names and numbers to be determined later, not those indicated on drawings.
5. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings
6. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", and braille.

C. Exterior Building Identification Signs: Building name cut metal letters and building address cut metal numbers.
1. Sign Type: As indicated on drawings
2. Sizes: As indicated on drawings
3. Finish: As indicated on drawings

D. Plaque:
1. Sign Type: As indicated on drawings
2. Sizes: As indicated on drawings

2.03 SIGN TYPES

A. Flat Identification Signs: Acrylic signage media without frame.
1. Edges: Square.
2. Corners: Square.
3. Frame Finish: As indicated on drawings
4. Wall Mounting of One-Sided Signs: Tape adhesive.
5. One-sided signs installed on glass shall have a blank back panel to conceal adhesive.
6. Color and Font: Unless otherwise indicated:
a. Character Font: Helvetica, Arial, or other sans serif font.
b. Character Case: Upper case only.
c. Background Color: as indicated on drawings.
d. Character Color: as indicated on drawings.

2.04 PLAQUES

A. Informational Plaques: Acrylic signage media with frame.

B. Edges: Square.

C. Corners: Square.

D. Frame Finish: As indicated on drawings

E. Clear Cover: Provide clear cover of polycarbonate plastic, glossy on back, non-glare on front.

F. Installation: As indicated on drawings.

G. Color and Font: Unless otherwise indicated:

1. Character Font: Helvetica, Arial, or other sans serif font.
2. Title Character Case: Upper case only.
3. Body Character Case: Sentence Case.
4. Background Color: as indicated on drawings.
5. Character Color: as indicated on drawings.

2.05 DIMENSIONAL LETTERS

A. Metal Letters, Numbers, & Shapes:
   1. Metal: Aluminum sheet, flat.
   2. Finish: As indicated on drawings
   3. Mounting: Concealed screws, stainless steel.
   4. Font: As indicated on drawings.
   5. Size: As indicated on drawings.
   6. Thickness: 1/2 inch Exterior

B. Logo Cut Metal Signage
   1. Type: Stainless Steel
   2. Gage: 18GA
   3. Finish: Powder coated (AAMA 2605) Color to be selection by architect with manufacturers range
   4. Mounting: Standoffs

2.06 INTERNALLY-ILLUMINATED CABINET SIGNS

A. Manufacturer's standard prefinished metal cabinet with high-performance translucent vinyl or digitally printed logo.

B. Depth: As indicated on Drawings.

C. Comply with local signage codes for size and location.

2.07 ACCESSORIES

A. Standoffs for Cut Metal: 2 1/2" and 5" bolted stainless steel

B. Concealed Screws: Stainless steel

C. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 2113.13
METAL TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal toilet compartments.

B. Urinal and Vestibule screens.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Concealed steel support members.

B. Section 06 1000 - Rough Carpentry: Blocking and supports.

C. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2025.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, door swings.

C. Product Data: Provide data on panel construction, hardware, and accessories.

D. Samples: Submit two samples of partition panels, 4" x 4" in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Toilet Compartments:
   1. ASI Global Partitions; Stainless Steel: www.asi-globalpartitions.com/#sle.
   2. Hadrian; Hadrian - Standard Series - Powder Coated: www.hadrian-inc.com/#sle.
   3. Substitutions: Section 01 6000 - Product Requirements.

2.02 COMPONENTS

A. Toilet Compartments: Powder coated steel, floor-mounted unbraced.

B. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound-deadening core, corners made with corner clips or mitered, welded, and ground smooth.
   1. Panel Faces: 22 gauge, 0.0299 inch.
   2. Door Faces: 22 gauge, 0.0299 inch.
   3. Pilaster Faces: 22 gauge, 0.0299 inch.
   4. Reinforcement: 12 gauge, 0.1046 inch.
   5. Internal Reinforcement: Provide in areas of attached hardware and fittings. Mark locations of reinforcement for partition mounted washroom accessories.

C. Door and Panel Dimensions:
   1. Thickness: 1 inch.

2. Door Width: 24 inches.
3. Door Width for Handicapped Use: 36 inch , out-swinging.
4. Height: 63-1/2 inches.

D. Pilasters: 1-1/4 inch thick, of sizes required to suit compartment width and spacing.

2.03 ACCESSORIES

A. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No.4 finish, 3 inches high, concealing floor fastenings.
1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow anodized aluminum tube, 1 by 1-5/8 inches in size, with anti-grip strips and cast socket wall brackets.

C. Brackets: Polished chrome-plated non-ferrous cast metal.

D. Attachments, Screws, and Bolts: Chrome-plated steel, tamper-proof type.
1. For attaching panels and pilasters to brackets: Through-bolts and nuts ; tamper proof.

E. Hardware: Polished chrome plated non-ferrous cast metal:
1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
2. Thumb turn or sliding door latch with exterior emergency access feature.
3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
4. Coat hook with rubber bumper; one per compartment, mounted on door.
5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged enamel finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 2601
WALL AND CORNER GUARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Corner guards.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Anchors for attachment of work of this section, concealed in wall.

B. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

D. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one (4"x4") sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Maintenance Materials: Furnish the following for the owner's use in maintenance of the project.
      a. Extra:5%
      b. See Section 01 6000 Product Requirements
   3. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.

2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wall and Corner Guards:
   1. Inpro: www.inprocorp.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS

A. Corner Guards - CG-1:
   1. Basis of Design: 150 High Impact Surface Mount Corrner Guard
   2. Material: High impact vinyl[<>].
   3. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
   4. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   5. Width of Wings: 3 inches.
   6. Corner: Square.
   7. Color: As indicated on drawings.
   8. Length: As indicated on drawings.
   9. Preformed top caps.

B. Stainless Steel Surface Mounted Corner/Wall Guard - CG-3
   1. Basis of Design: Inpro Stainless Steel Cement-on, 430 Stainless Steel, - SAS-183128C-430
   2. Gage: 16
   3. Wings: 3"(89mm) x 3"(89mm)
   4. Length: As indicated on drawings
   5. Attachment: Cement-on

2.03 FABRICATION

A. Fabricate components with tight joints, corners and seams.

B. Pre-drill holes for attachment.

C. Form end trim closure by capping and finishing smooth.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/4 inch.

B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

END OF SECTION

SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Commercial shower and bath accessories.

C. Under-lavatory pipe supply covers.

D. Accessories for toilet rooms, showers, and utility rooms.

E. Diaper changing stations.

F. Utility room accessories.

G. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 08 8300 - Mirrors: Other mirrors.

B. Section 09 3000 - Tiling: Ceramic washroom accessories.

C. Section 10 2113.13 - Metal Toilet Compartments.

D. Section 22 4000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

D. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2025.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

F. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

G. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

H. ASTM C1036 - Standard Specification for Flat Glass; 2025.

I. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.

J. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2021.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

L. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

M. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one color chip sample of each type scheduled.

C. Submittals for Information
   1. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   2. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.06 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.07 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. AJW Architectural Products: www.ajw.com.
   2. American Specialties, Inc: www.americanspecialties.com.
   3. Bradley Corporation: www.bradleycorp.com.
   4. Georgia-Pacific Professional: www.blue-connect.com.
   5. Substitutions: Section 01 6000 - Product Requirements.

B. Under-Lavatory Pipe Supply Covers:
   1. Plumberex Specialty Products, Inc: www.plumberex.com/#sle.
   2. Substitutions: Section 01 6000 - Product Requirements.

C. Diaper Changing Stations:
   1. American Specialties, Inc: www.americanspecialties.com.
   2. Bradley Corporation: www.bradleycorp.com.
   3. Koala Kare Products: www.koalabear.com.
   4. Substitutions: 01 6000 - Product Requirements.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

B. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

C. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

D. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Double jumbo roll, surface mounted, stainless steel, spindleless type for tension spring delivery designed to prevent theft of tissue roll.
   1. Product: B-2892 manufactured by Bobrick.
   2. Substitutions: Section 01 6000 - Product Requirements.

B. Combination Paper Towel Dispenser/Waste Receptacle: Semi-Recessed, stainless steel; seamless wall flanges, continuous piano hinges, tumbler locks on upper and lower doors.
   1. Towel dispenser capacity: 600 C-Fold minimum.
   2. Waste receptacle capacity: 18 gallons minimum.
   3. Products:

a. Product: B-3947 manufactured by Bobrick.
b. Substitutions: Section 01 6000 - Product Requirements.

C. Automated Soap Dispenser: Liquid soap dispenser, wall-mounted, with stainless steel cover and window to gauge soap level, tumbler lock.
1. Products:
a. Georgia-Pacific Professional; GP enMotion Brushed Stainless Automated Touchless Soap and Sanitizer Dispenser: www.blue-connect.com.
b. Substitutions: Section 01 6000 - Product Requirements.

D. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
2. Size: As indicated on drawings.
3. Frame: 0.05 inchangle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
5. Products:
a. Basis of Design: Model 20650 Roval Inter-Lok Stainless Steel Framed Mirror manufactured by American Specialties, Inc.
b. Substitutions: Section 01 6000 - Product Requirements.

E. Grab Bars: Stainless steel, 1-1/2 inches outside diameter, minimum 0.05 inch wall thickness, satin surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
1. Length and configuration: As indicated on drawings.
2. Provide and install detention rated grab bars in Holding Cell 136B
a. Products:
1) Basis of Design: GBS Prison High Security Grab Bars, Product ID: 998-GBS-High-Security-Bar
2) Substitutions: Section 01 6000 - Product Requirements
3. Provide and install shower-style grab bars in Restroom 004

F. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
1. Products:
a. Basis of Design: B-270 Contura Series Surface Mounted Sanitary Napkin Disposal manufactured by Bobrick.
b. Substitutions: Section 01 6000 - Product Requirements.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners.
1. Provide at all shower locations.

B. Shower Curtains:
1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant. Integral Hooks.
2. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
3. Color: White.
4. Provide at all shower locations.

C. Coat Hook (CH): Surface mounted double coat hook. Product: Model 9B1 Manufactured by Bradley: Finish: Stainless Steel

2.06 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:

1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
3. Construction: 1/8 inch flexible PVC.
    a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
    b. Comply with ASTM C1822, type indicated.
    c. Comply with ASME A112.18.9.
    d. Comply with ICC A117.1.
    e. Microbial and Fungal Resistance: Comply with ASTM G21.
4. Color: White.
5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.

2.07 DIAPER CHANGING STATIONS

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
    1. Style: Horizontal
    2. Material: Polyethylene.
    3. Mounting: Surface.
    4. Color: Gray.
    5. Minimum Rated Load: 250 pounds.
    6. Manufacturers:
        a. American Specialties, Inc.: www.americanspecialties.com.
        b. Bradley Corporation: www.bradleycorp.com.
        c. Koala Kare Products: www.koalabear.com.
        d. Substitutions: 01 6000 - Product Requirements.

2.08 UTILITY ROOM ACCESSORIES

A. Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, hat-shaped channel.
    1. Holders: Four spring-loaded rubber cam holders.
    2. Length: 36 inches.
    3. Product: B-223x36 manufactured by Bobrick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

D. See Section 06 1000 - Rough Carpentry for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights and Locations: As required by accessibility regulations, unless otherwise indicated.

D. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; Current Edition.

B. NFPA 10 - Standard for Portable Fire Extinguishers; 2026.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate cabinet physical dimensions and rough-in measurements for recessed cabinets.

C. Product Data: Provide extinguisher operational features.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguisher Cabinets and Accessories:
   1. JL Industries, Inc: www.jlindustries.com.
   2. Larsen's Manufacturing Co: www.larsensmfg.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Class: 4A-80BC type.
   2. Size: 10 pound.
   3. Finish: Baked polyester powder coat, Red color.
   4. Temperature Range: Minus 40 degrees F to Manufacturer standard degrees F.
   5. Manufacturer: Basis of Design Amerex Corporation, Model 592.

2.03 FIRE EXTINGUISHER CABINETS

A. Metal: Formed stainless steel sheet; 0.036 inch thick base metal.

B. Cabinet Configuration: Semi-recessed
   1. Size to accommodate accessories.
   2. Trimless type.

C. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinge.

D. Door Glazing: Float glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.

E. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

F. Weld, fill, and grind components smooth.

G. Finish of Cabinet Exterior Trim and Door: No. 4 - Brushed stainless steel.

H. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Cabinet Signage: Provide signage as follows:
   1. Doors with a full clear glass panel where the equipment in the cabinet is clearly visible are not required to have signage.
   2. Doors without a full clear glass panel shall have "FIRE EXTINGUISHER" in 2 inch high letters in a contrasting color on the cabinet.
   3. Doors without a full clear glass panel, and not large enough for signage, shall have a permanently attached pictogram of the equipment contained in the cabinet.
   4. Comply with local code requirements for additional signage.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure rigidly in place.

C. Place extinguishers in cabinets.

END OF SECTION

SECTION 10 5113
METAL LOCKERS AND STORAGE SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lockers.

B. Locker benches.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete base construction.

B. Section 06 1000 - Rough Carpentry: Wood base construction.

C. Section 06 1000 - Rough Carpentry: Wood blocking and nailers.

D. Sections in Division 9 – Finishes, relating to finish floor and base materials

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2026.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

D. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface; 2022.

E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

F. ASTM F1267 - Standard Specification for Metal, Expanded, Steel; 2018 (Reapproved 2023).

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, numbering plan, elevations, and details as required to outline size, finish, and installation of all products in every location/application.
   3. Samples for Verification:
      a. Submit one (2"x2") sample illustrating color, pattern, and design of each type specified.
      b. Submittals for Information
   4. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   5. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.
   6. Submittals for Project Closeout
      a. Operation and Maintenance Data
      b. See Section 01 7000 Execution and Closeout Requirements
   7. Warranty

a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.08 FIELD CONDITIONS

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Lockers:
   1. Lyon Workspace Products: www.lyonworkspace.com
   2. Salsbury Industries: https://www.lockers.com
   3. Spacesaver Corporation; https://www.spacesaver.com/
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TWO-TIER METAL LOCKERS, FREE-STANDING WITH MATCHING CLOSED BASE.

A. Two-Tier Lockers: Metal lockers
   1. Lockers: Factory assembled, made of formed sheet steel, ASTM A653/A653M SS Grade 33/230, with G60/Z180 coating, strectcher leveled; metal edge finished smooth without burrs; backed enamel finished inside and out.
      a. Where ends or sides are exposed, provide flush panel closers.
   2. Locker Body: formed and flanged; with steel stiffener ribs; electric spot welded.
      a. Body and Shelves: 24 gauge, 0.0239 inch
      b. Base: 20 gauge, 0.036 inch
      c. Metal Base: 4 inch, "Z" base with closed ends
   3. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskers and latching for quiet operation.
      a. Door frame: 16 gauge, 0.0598 inch, minimum.
   4. Doors: Hollow double pan, sandwich construction, 1-3/16 inch thick; welded construction, channel reiforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.
      a. Door outer face: 16 gauge
      b. Door inner face: 16 gauge
      c. Form recess for perating handle and locking device.
      d. Provide louvers in door face, top and bottom, for ventilation.
   5. Hinges: Three for doors over 42 inches high; weld securely to locker body and door.
      a. Hinge Thickness: 14 gauge
   6. Width: As indicated on drawings.
   7. Depth: 18 inches.
   8. Height: 36 inches.
   9. Configuration: Two-tier.
      a. Fittings: Size and configuration as indicated on drawings.
      b. Hooks: Three wall-mounted, single prong stainless steel coat hooks.
      c. Ventilation: Manufacturer's standard louvers in each door panel.
      d. Locking: Padlock hasps, for padlocks provided by Owner.
      e. Handle: Recessed Stainless Steel
      f. Provide sloped top.
      g. Fillers: sloping in-line top fillers, sloping corner fillers, filler panels in corners
      h. Color: Red
      i. Metal Base: 4" Z base with closed ends
      j. Locker Tag Numbers
         1) Shall provide locker numbers on each locker per customer requirement

2.03 ACCESSIBLE LOCKER BENCHES

A. Locker Benches: Stationary type; bench top of laminated birch; painted steel pedestals.
   1. Basis of design: Salsbury Industries Wood ADA Locker Bench with back support, Model Number: 77781-ADAB-LGT
   2. Width: 42 inches.
   3. Height: 18 inches.
   4. Depth: 20 inches.
   5. Finish: Light

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases are in correct position and configuration.

B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install lockers plumb and square.

C. Install shelving plumb and square.

D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 pounds.

E. Bolt adjoining locker units together to provide rigid installation.

F. Install end panels, filler panels, and sloped tops.

G. Install fittings if not factory installed.

H. Replace components that do not operate smoothly.

3.03 CLEANING

A. Clean locker interiors and exterior surfaces.

3.04 PROTECTION

A. Protect system against damage during remainder of construction period. Advise owner of additional protection needed to ensure that system will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 10 5723
CLOSET AND UTILITY SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted wire closet shelving.

B. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking in walls for attachment of shelving.

B. Section 09 2116 - Gypsum Board Assemblies: Blocking in metal stud walls for attachment of standards.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application.

C. Submittals for Project Closeout
   1. Operation and Maintenance Data
      a. See Section 01 7000 Execution and Closeout Requirements
   2. Warranty
      a. Acknowledge warranty duration and scope covered by warranty.

1.04 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
   1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
   2. See Section 01 4000 – Quality Requirements

C. Sourcing
   1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
   1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.05 WARRANTY

A. Manufacturers Warranty
   1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
   1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (lighting, temperature, humidity, and ventilation) within limits outlined by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wire Storage Shelving:
   1. ClosetMaid Corporation : www.closetmaid.com.
   2. RubberMaid Closet and Organization Products : www.rubbermaidcloset.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Wire Shelving: Factory-assembled coated wire mesh shelf assemblies for wall-mounting, with all components and connections required to produce a rigid structure that is free of buckling and warping.
   1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
   2. Coating: PVC or epoxy, applied after fabrication, covering all surfaces.
   3. PVC Coating: 9 to 11 mils thick.
   4. Epoxy Coating: Non-toxic epoxy-polyester powder coating baked-on finish, 3 to 5 mils thick.
   5. Standard Mesh Shelves: Cross deck wires spaced at 1 inch.

B. Mounting Hardware: Provide manufacturer's standard mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories as required for complete and secure installation; factory finished to match shelving.

C. Fasteners: As recommended by manufacturer for mounting substrates.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect areas to receive shelving, to verify that spaces are properly prepared to receive shelf units, and are of dimensions indicated on shop drawings.

B. Verify appropriate fastening hardware.

C. Do not begin installation until substrates have been properly prepared.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, with shelf surfaces level.

B. Cap exposed ends of cut wires.

C. Install back clips, end clips at side walls, and support braces at open ends. Install intermediate support braces as recommended by manufacturer.

3.04 CLEANING

A. Clean soiled surfaces after installation.

3.05 PROTECTION

A. Protect installed work from damage.

B. Touch-up, repair, or replace damaged products before Substantial Completion in a manner that eliminates evidence of replacement.

END OF SECTION

SECTION 10 7316.13
METAL CANOPIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hanger rod style shop fabricated metal canopies.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM E2950 - Standard Specification for Metal Canopy Systems; 2014 (Reapproved 2020).

C. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit product data sheets, including material descriptions and finishes, and preparation instructions and recommendations.

C. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing profiles, sections of components, finishes, and fastening details.

D. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
   1. Comply with applicable code for submission of design calculations as required for acquiring permits.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site ready for erection.

B. Package using methods that prevent damage during shipping and storage on site.

C. Store materials under cover and elevated above grade.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Canopies:
   1. Mapes Canopies: SuperShade; www.mapescanopies.com
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 METAL CANOPIES

A. Shop Fabricated Metal Canopy
   1. Pre-engineered system complying with ASTM E2950.
   2. Design and fabricate metal canopy system to resist wind, snow, and live loads without failure, damage, or permanent deflection in accordance with ASCE 7:
      a. Loads: As indicated on drawings.
   3. Thermal Movement: Design canopy system to accommodate thermal movement caused by ambient temperature range of 120 degrees F and surface temperature range of 180 degrees F without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects on assembly components.

2.03 COMPONENTS

A. Materials:
   1. Sun shading elements shall consist of extruded aluminum louver blades. (minimum .110 thickness)
   2. Intermediate framing members shall be extruded aluminum, alloy 6063-T6, in profile and thickness shown in current Mapes brochures.
   3. Cantilever support brackets shall be design engineered per application.
   4. Cantilever support brackets will have standard available finishes.
   5. Fascia shall be standard extruded 8" J style.

2.04 SHOP FABRICATION

A. Provide a complete system ready for erection at project site.

B. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.

C. Perform welding in accordance with AWS D1.1/D1.1M.

D. Fabricate connections for bolt, nut, and washer connectors.

2.05 FINISHES

A. Finish: As selected by the architect from full range of standard and premium finishes. Provide physical color sample for review/verification.

2.06 ACCESSORIES

A. Fasteners: As recommended by manufacturer. Minimum shear stress of 350 lb. Pre-welded or factory-welded connections are not acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and site area for conditions that might prevent satisfactory installation.

B. Verify that foundation, electrical utilities, and placed anchors are in correct position.

C. Do not proceed with installation until all conditions are satisfactory.

3.02 INSTALLATION - FRAMING

A. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation.

B. Do not field cut or alter structural members without approval.

C. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 INSTALLATION - CANOPY COVERING

A. Install in accordance with manufacturer's instructions.

B. Fasten metal decking to steel support members, aligned level and plumb.

C. Install fascia panels, trim, and flashing.

D. Separate dissimilar metals using concealed bituminous paint.

E. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 CLEANING

A. Clean surfaces of dust and debris; follow manufacturer's cleaning instructions for the finish used.

3.05 PROTECTION

A. Protect canopy after installation to prevent damage due to other work until Date of Substantial Completion.

END OF SECTION

SECTION 11 41 26
WALK-IN COOLERS AND FREEZERS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Prefabricated modular indoor walk-in cooler and freezer two-compartment combination enclosure, consisting of foamed-in-place polyurethane insulated wall, ceiling, and floor panels; female bottom screed rail; entrance door assemblies and specialty track port door; door hardware; interior vapor-proof LED lighting; digital controls; and remote split refrigeration systems.

B. Compartment Layout:
   1. Cooler Compartment: Floorless walk-in cooler, operating at +35.0°F (+1.6°C), nominal interior dimensions per plan, 13'-1" overall exterior height.
   2. Freezer Compartment: Walk-in freezer with insulated panel floor, operating at -10.0°F (-23.3°C), nominal interior dimensions per plan, 13'-1" overall exterior height.
   3. Overall Footprint: 23'-0" Long × 14'-6" Wide × 13'-1" High (3,846 internal cubic feet total capacity).

C. Related Requirements:
   1. Section 03 30 00 – Cast-in-Place Concrete: Level interior concrete floor slab finished smooth to receive female screed rail and insulated freezer floor panels; verify floor temperature ($70.0°$F design basis) and vapor barrier installation.
   2. Section 22 10 00 – Plumbing Piping: Evaporator condensate drain piping, trap assembly, drain pan connections, and heated condensate lines routed to indirect building floor sinks.
   3. Section 26 05 00 – Common Work Results for Electrical: Dedicated branch power circuits, disconnect switches, and field wiring connections to condensing units, unit coolers, door heater circuits, heated air vents, and light switches.

1.02 REFERENCES

A. ASTM International:
   1. ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
   2. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials (Flame Spread Index ≤ 25, Smoke Developed Index ≤ 450).

B. Underwriters Laboratories (UL) & Standards:
   1. cULus / CSA: Commercial Refrigeration electrical certification.
   2. UL 723 / ULC: Test for Surface Burning Characteristics of Building Materials (UL Flame Spread 25 / ULC Flame Spread 50).

C. Sanitation, Energy, & Building Codes:
   1. NSF/ANSI Standard 7: Food Service Equipment sanitation compliance.
   2. EISA 2007 & DOE 10 CFR Part 431 (AWEF): Federal energy conservation standards for walk-in coolers and freezers.
   3. ASHRAE: Environmental design conditions and cooling load compliance calculations.

1.03 ADMINISTRATIVE & ACTION SUBMITTALS

A. Product Data: Manufacturer technical specification sheets for panels, polyurethane foam insulation core properties, panel metal skins and gauges, door construction, gaskets, hardware, and complete mechanical refrigeration equipment schedules.

B. Shop Drawings: Detailed shop drawings prepared by the walk-in manufacturer indicating:

1. Overall plans, compartment dividing partition wall location, elevations, and structural panel joint layouts.
2. Details of the female bottom rail assembly for the floorless cooler and floor panel joinery for the freezer.
3. Jamb details, framing reinforcements, rough opening dimensions, and sill construction for both the standard swing door and the specialty track port door.
4. Evaporator coil suspension details, piping penetrations, and remote condensing unit field mechanical connection sizes.

C. Informational Submittals:
1. Manufacturer installation manuals, panel locking torque specs, and joint sealing procedures.
2. Elevation correction factors and design calculations (based on 4,646 ft project elevation and 90.0°F ambient design).

D. Closeout Submittals:
1. Operation and Maintenance (O&M) data for panels, doors, hardware, and refrigeration components.
2. Executed manufacturer warranty certificates.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm specializing in commercial walk-in cold storage manufacturing with a minimum of ten (10) consecutive years of documented production history.

B. Thermal & Environmental Compliance: Insulating core shall be zero-ODP, CFC-free, HFO LBA (liquid blowing agent) rigid polyurethane foam.

C. Regulatory Approvals: Complete walk-in enclosure assembly shall bear the NSF International seal of approval. Electrical components and refrigeration assemblies shall be cULus listed.

D. Environmental Site Operating Limits: Walk-in combination enclosure is designed for indoor installation within an environmentally controlled conditioned space maintained between 30% and 60% Relative Humidity with a dew point of 50.0°F (10.0°C) or lower.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver walk-in panels, refrigeration skids, doors, and accessories in factory-crated packaging.

B. Store panels flat, off the ground, in an enclosed, dry, weather-tight conditioned building space.

C. Protect metal panel skins from transit scratches, dents, and surface marring.

1.06 WARRANTY

A. Enclosure Panels: Manufacturer standard fifteen (15) year limited warranty covering panel structural integrity and thermal insulation performance.

B. Refrigeration Parts & Labor: Standard eighteen (18) month parts and labor warranty on complete refrigeration systems.

C. Compressors: Optional five (5) year extended replacement warranty covering the remote condensing unit scroll and hermetic compressors.

1.07 QUALIFICATIONS

A. Qualifications: The Foodservice Equipment Contractor must be capable of purchasing all equipment and materials as required by the Specifications, and perform all services required in a timely manner, and as dictated by the Construction Schedule. The FSEC project manager must have a minimum of (ten) 10 years' experience in the Construction Industry performing similar tasks.

PART 2 – PRODUCTS

2.01 MANUFACTURERS & BASIS OF DESIGN

A. Basis of Design Manufacturer: Nor-Lake, Inc. / Refrigerated Solutions Group (RSG), 891 County Rd U, Hudson, WI 54016.
B. Model Line: Nor-Lake FINELINE Indoor Walk-In Cooler/Freezer Combination (2 Compartments).
C. Substitutions: Strictly in accordance with Section 01 25 00. Any proposed alternate manufacturer must meet or exceed all specified dimensions, structural metal gauges, door hardware heavy-duty ratings, and ASHRAE-rated refrigeration capacities.

2.02 PERFORMANCE CRITERIA & REFRIGERATION LOAD

A. Cooler Compartment Performance:
    1. Operating Temperature: Maintain constant +35.0°F (+1.6°C) internal box temperature.
    2. Design Heat Load: Sized for holding product load calculated at 19,625 BTU/hr based on 90.0°F entering ambient, 4,646 ft site elevation, and 70.0°F floor slab temperature.
B. Freezer Compartment Performance:
    1. Operating Temperature: Maintain constant -10.0°F (-23.3°C) internal box temperature.
    2. Design Heat Load: Sized for holding product load calculated at 6,726 BTU/hr based on 90.0°F entering ambient, 4,646 ft site elevation, and 70.0°F floor slab temperature.
C. Panel Fire & Smoke Performance: Finished composite panel shall exhibit a Flame Spread Index of 25 or less (UL) / 50 or less (ULC) and Smoke Developed Index of 450 or less per ASTM E84.

2.03 PANEL CONSTRUCTION & COMPONENT MATERIALS

A. Insulation Core: Minimum 4-inch-thick rigid polyurethane foam insulation foamed-in-place (FIP) with zero-ODP HFO LBA formulation.
B. Metal Skin Finishes:
    1. Interior Walls & Ceilings (General): 26-gauge corrosion-resistant stucco-embossed coated steel (and selected 22-gauge stainless steel wall/ceiling liners where indicated).
    2. Exterior Exposed Walls & Tops: 26-gauge corrosion-resistant stucco-embossed coated steel; exterior ceiling topside and floor bottom side 26-gauge corrosion-resistant steel.
C. Floor Construction:
    1. Cooler Compartment: Floorless construction utilizing factory-supplied heavy-gauge vinyl/metal female bottom screed rail anchored to concrete slab.
    2. Freezer Compartment: 4-inch insulated floor panels foamed-in-place with 26-gauge corrosion-resistant bottom skin and .100-inch heavy-duty smooth aluminum interior wearing floor surface. Floor panels rated to support a minimum of 800 lbs/sq ft evenly distributed live load.
D. Panel Joinery: Tongue-and-groove joint profile equipped with heavy-duty eccentric male/female cam-action roto-lock fasteners operated from interior access ports; factory-installed flexible compression joint gaskets providing an airtight and vapor-tight perimeter seal. Provide flush-matching plastic plug buttons for all cam-lock access holes.

2.04 ENTRANCE DOORS & HARDWARE

A. Freezer Compartment Door (36" × 78" In-Fitting Swing Door):
    1. Clear Opening: 36 inches wide by 78 inches high, flush-mounted in-fitting leaf, left-hand swing.
    2. Hinges & Closer: Heavy-duty cam-lift hinges (including one spring-loaded hinge for positive closure) and hydraulic overhead door closer.
    3. Latch Assembly: Nor-Lake NL9800 heavy-duty deadbolt key/padlock handle with interior glow-in-the-dark safety push release.

4. Perimeter Sealing & Thermal Management: Three-sided magnetic compression gasket, dual bottom sweep gasket, built-in perimeter electrical heater wire circuit in door frame, and factory-installed heated pressure relief air vent.
5. Lighting & Control: Factory pre-wired vapor-proof LED fixture and exterior NL508 combination digital thermometer display and pilot-light rocker switch.

B. Cooler Compartment Track Port Door (Jamison Polyfoam II Series):
1. Door Model: Jamison Plyfoam II (Jamofoam II) single-leaf swinging track door designed for overhead meat rail/trolley track penetration.
2. Clear Opening: 5'-0" (60 inches) wide by 9'-0" (108 inches) high.
3. Track Port Dimension: Top of rail dimension centered at 114 inches above finished floor line; complete with factory structural framing reinforcements.
4. Construction & Finish: 4-inch foamed-in-place polyurethane core; 26-gauge pre-painted white stucco-embossed steel front face, 24-gauge stainless steel back face, pre-painted white stucco casings, and flush sill configuration.
5. Hardware Package: Four (4) Jamison JB heavy-duty self-rising super-duty chrome hinges, Jamison K55 chrome latch, stainless steel leveling shims, and 8-inch galvanized carriage bolt wall through-fasteners.
6. Lighting & Control Opening: Factory-framed rough opening including backing reinforcement, vapor-proof LED fixture, and Nor-Lake NL508 combination digital thermometer/switch.

2.05 REFRIGERATION MECHANICAL SYSTEMS

A. General Mechanical Configuration: Factory-matched remote air-cooled Split Pak refrigeration condensing units and direct-expansion unit cooler evaporators, pre-engineered for R-448A/R-449A low-GWP refrigerant. Condensing units are factory-rated for outdoor operation at 100°F condenser ambient.

B. Freezer Refrigeration System (-10.0°F Room):
1. Condensing Unit (Model MSLD025AB):
a) Capacity & Compressor: 2.5 HP low-temperature scroll compressor rated at 7,007 BTU/hr system capacity at -10°F box setpoint.
b) Electrical: 208-230V / 60Hz / 1-Phase; Minimum Circuit Ampacity (MCA) 33A; Maximum Overcurrent Protection (MOP) 35A; Rated Load Amps (RLA) 16A; Locked Rotor Amps (LRA) 73A.
2. Accessories: Heavy-duty outdoor weather-resistant housing (Base M3: 30" L × 31" W × 26" H), mounted defrost timer, liquid line filter-drier, sight glass, high/low pressure controls, and outdoor winter ambient heater kit (for operation below -10°F ambient).
3. Line Connections: 3/8" OD liquid line; 7/8" OD suction line.
4. Evaporator Unit Cooler (Model E1LD0106B-TE2):
a) Capacity: 10,600 BTU/hr coil capacity; electric defrost cycle.
b) Electrical: 208-230V / 60Hz / 1-Phase; Fan Amps 1.0A; Defrost Heater Amps 9.8A.
c) Trim & Controls: Factory-mounted thermal expansion valve (TXV), mechanical/electronic temperature control, and liquid line solenoid valve.

C. Cooler Refrigeration System (+35.0°F Room):
1. Condensing Unit (Model MHMD012AB):
a) Capacity & Compressor: 1.25 HP medium-temperature hermetic compressor rated at 9,507 BTU/hr system capacity at +35°F box setpoint.
b) Electrical: 208-230V / 60Hz / 1-Phase; MCA 19A; MOP 20A; RLA 9A; LRA 51A.

2. Accessories: Heavy-duty outdoor housing (Base M2: 38" L × 27" W × 18" H), mounted timer, pressure controls, and outdoor low-ambient heater kit.
3. Line Connections: 3/8" OD liquid line; 7/8" OD suction line.
4. Evaporator Unit Cooler (Model E1MD0109A-TA2):
    a) Capacity: 10,900 BTU/hr coil capacity; off-cycle air defrost.
    b) Electrical: 115V / 60Hz / 1-Phase; Fan Amps 1.6A.
    c) Trim & Controls: Factory-mounted TXV, temperature control, and liquid line solenoid valve.
    d) Pressure-test field-piped refrigerant lines with dry nitrogen to 300 psi; evacuate systems to a minimum vacuum level of 500 microns.
    e) Confirm correct refrigerant charge of R-448A / R-449A and adjust TXV superheat settings according to factory guidelines.
    f) Test freezer electric defrost termination and verify drain line heat tape operation to prevent freeze-ups in condensate drain piping.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Installation:
    1. Equipment installation shall conform to current Standards and Revisions established by the National Sanitation Foundation, Ann Arbor, Michigan, and to prevailing local codes and regulations.
    2. Provide a competent service representative during installation and on the first day of operation. The representative shall be well informed as to all phases of the Work. Put into proper operating condition all equipment and instruct the Owner’s employees in the proper use and maintenance schedule to be followed thereafter. Copies of all instructional, operational and maintenance manuals or charts for equipment shall be furnished to the owner unless permanently fastened to the equipment to the satisfaction of the Owner.
    3. Qualification of installers: Minimum 10 years’ experience in this and similar work, including field welding.
    4. Sealing: Seal equipment against walls or other fixed equipment with silicone sealant, 1/4” maximum width.
    5. Trim: Material to match equipment surface; trim equipment in wall openings, recesses, or abutting a wall that cannot be effectively sealed with silicone; exposed fasteners are not acceptable.
    6. Protection: Protect equipment from damage until final cleaning and Owner acceptance.
    7. Schedule: Comply with project construction schedule; notify the Owners representative at least 30 days in advance (in writing) if schedule cannot be met.
    8. Damage and/or Loss: Replace or repair items that are lost or damaged prior to owner acceptance.
B. Field Measurements:
    1. Dimensions shown on Contract Documents are approximate and as accurate as can be determined at this time. Field dimension all measurements at the building conditions. Where obstructions occur, equipment shall be neatly scribed, fitted to and around the obstruction, resulting in a sanitary homogeneous fixture.
C. Preparation of Surfaces:

1. Assume the expense and coordinate cutting and patching of walls, partitions, ceilings and floors necessary to receive equipment caused by incorrect finished equipment dimensions, or by failure to coordinate with other trades.

D. Field Quality Control:
   1. Maintain at the site of the Work one (1) copy of the Plans, Specifications and Shop Drawings and at all times give the Owner and representatives of the Owner access thereto.
   2. The FSEC shall have an experienced field representative on the site to coordinate with other trades and assist the trades in establishing proper rough-in locations as shown on the Shop Drawings. Check all rough-in connections once installed to ensure that the equipment service connections are as close to rough-in locations as possible.

E. Adjustment and Cleaning/Demonstration and Testing:
   1. Protect motors, pumps, electrical control centers, heating elements and all similar items, which are a part of the Work, from dirt, grime, plaster and water during all phases of construction. Protection shall be to the satisfaction of the Owner.
   2. Clean and polish all equipment prior to the inspection and acceptance of the Work by the Owner.
   3. Demonstration: Schedule times with the owner's representative to provide instruction of the maintenance and use of each item; demonstrate operation to appropriate inspectors if required; verify that copies of instruction, operational maintenance manuals have been provided in a timely manner to the operator.
   4. Testing: Test, regulate and put into proper operating condition; calibrate controls, including thermostats.

F. Damage and/or Loss
   1. All responsibilities shall rest with the FSEC for any damage or loss to the Work incurred prior to Owner acceptance. Items that are lost or damaged shall immediately be replaced or repaired to a new condition at the FSEC's expense to the complete satisfaction of the Owner.

END OF SECTION

SECTION 12 2400
ROLLER SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sunscreen roller shades.

B. Room darkening roller shades.

1.02 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.

1.03 REFERENCES

A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

B. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
   3. Storage and handling requirements and recommendations.
   4. Mounting details and installation methods.
   5. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.

C. Shop Drawings: Plans,sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.

D. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.

E. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

C. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

D. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.08 WARRANTY

A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating twenty-five year limited warranty.

B. Ecoveil Shadecloth: Manufacturer's standard ten year warranty.

C. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Mecho, which is located at: 42-03 35th St.; Long Island City, NY 11101; Tel: 718-729-2020; Fax: 718-729-2941; Email:marketing@mechoshade.com; Web:http://www.mechoshade.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.02 ROLLER SHADE TYPE AND SHADECLOTH

A. Manually Operated Shades:
   1. Mounting: Surface mounted with fascia.
   2. Configuration: Single solar shadecloth.
   3. Solar Shadecloths:
      a.
      b. Color: As indicated on Drawings.
   4. Mecho5x, Managed Lift Force, Hardware: Lifts single band or multiband shade assemblies:
      a. Lifting Force: 3.5 to 8.5 pounds (1.6 to 3.9 kg) for shade assemblies with a shade band hanging weight, not including mounting hardware, of 35 pounds (16 kg).
      b. Backward compatible to Mecho-5 components including facia, regular and reverse roll, pockets, and wall-mounting accessories.
      c. Includes offset drive capability, left/right, front, or back to allow for utilization of blackout or Shade Loc Zipper channels.
      d. Allows for ease of operation when obstructions do not allow for direct drive chain access.
      e. Offset chain drive shall not cause an increase of friction or pull force when operated up to a 26 degree angle from vertical.

2.03 SHADE BAND

A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
   1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
   2. Shade Band and Shade Roller Attachment:
      a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades are not acceptable.
      b. Provide for positive mechanical engagement with drive / brake mechanism.

c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" "snap-off" spline mounting, without having to remove shade roller from shade brackets.
d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
e. Any method of attaching shade band to roller tube that requires the use of adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.04 SHADE FABRICATION

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:
1. Hembar: Exposed hembar.

C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

D. For railroaded shade bands, provide seams in railroaded multi-width shade bands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shade bands.

E. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shade bands.

F. Blackout shade bands, when used in side channels, shall have horizontally mounted, roll-formed stainless steel or tempered-steel battens not more than 3 feet (914 mm) on center extending fully into the side channels. Battens shall be concealed in an integrally-colored fabric to match the inside and outside colors of the shade band, in accordance with manufacturer's published standards for spacing and requirements.
1. Battens shall be roll formed of stainless steel or tempered steel and concave to match the contour of the roller tube.
2. Batten pockets shall be self-colored fabric front and back RF welded into the shadecloth. A self-color opaque liner shall be provided front and back to eliminate any see through of the batten pocket that shall not exceed 1-1/2 inches (38 mm) high and be totally opaque. A see-through moire effect, which occurs with multiple layers of transparent fabrics, shall not be acceptable.

2.05 COMPONENTS

A. Access and Material Requirements:
1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.

3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.

B. Manual Operated Chain Drive Hardware and Brackets, Mecho5x:
   1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
   2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
   3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
   4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
   5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
   6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable
   7. Provide shade hardware constructed of minimum 1/8 inch (3 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
   8. Drive Bracket / Brake Assembly:
      a. Mecho Drive Bracket model Mecho5x shall be fully integrated with all Mecho accessories, including, but not limited to: SnapLoc fascia, SnapLoc Zipper channels, room darkening side / sill channels, center supports and connectors for multi-banded shades.
      b. Mecho5x drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.5 mm) steel pin.
      c. The brake shall be an over-running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
      d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
      e. The entire Mecho5x assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
      f. Drive Chain: No. 10 qualified stainless steel chain rated to 90 lbs (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

2.06 ACCESSORIES

A. Fascia:
   1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
   2. Fascia shall be able to be installed across two or more shade bands in one piece.
   3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
   4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
   5. Notching of Fascia for manual chain shall not be acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (51 mm) to interior face of glass. Allow proper clearances for window operation hardware.

B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

D. Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 12 3600
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Wall-hung counters and vanity tops.

1.02 RELATED REQUIREMENTS

A. Section 06 2000 - Finish Carpentry.

B. Section 06 4100 - Architectural Wood Casework.

C. Section 22 4000 - Plumbing Fixtures

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.

C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

F. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

G. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.

H. MIA (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.

I. PS 1 - Structural Plywood; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Submittals for Review
   1. Product Data: Include manufacturer specific information for the following:
      a. Product Data Sheet(s) outlining specified product features and applicable accessories
      b. Installation Instructions
   2. Shop Drawings: Include plans, elevations, and details as required to outline size, finish, and installation of all products in every location/application. Include as part of 06 4100 Architectural Wood Casework.
   3. Samples for Verification:
      a. Submit one 4"x4" sample illustrating color, pattern, and design of each type scheduled.

C. Submittals for Information
   1. Testing Reports
      a. Certified test data from an independent testing agency verifying that products meet or exceed specified requirements.
   2. Manufacturer's Qualification Statement
      a. Manufacturer's Qualifications Statement: Certify products meet or exceed specified requirements.
   3. Installers Qualification Statement
      a. Installer's Qualifications Statement: Certify installers meet or exceed specified requirements.

D. Submittals for Project Closeout

1. Operation and Maintenance Data
    a. See Section 01 7000 Execution and Closeout Requirements
2. Warranty
    a. Acknowledge warranty duration and scope covered by warranty.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
    1. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum (five) years of documented experience.
    2. See Section 01 4000 – Quality Requirements

B. Installer Qualifications
    1. Installer's Qualifications: Company specializing in performing the work of this section with minimum (five) years of documented experience.
    2. See Section 01 4000 – Quality Requirements

C. Sourcing
    1. Single Source Responsibility: Provide and install this work from a single fabricator.

D. Sequencing
    1. Sequencing: sequence work to ensure proper coordination with affected trades and according to manufacturer’s requirements for testing and site preparation.

1.06 WARRANTY

A. Manufacturers Warranty
    1. Provide manufacturer's standard written warranty against defects in materials.

B. Installation Warranty
    1. Provide installer's standard written warranty against defects in installation methods and workmanship.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

B. Store and protect products in accordance with manufacturers' instructions.

C. Comply with manufacturer's warranty conditions when applicable.

D. Deliver, store, handle, and protect materials in accordance with manufacturer's written instructions.
    1. Provide protective coverings of suitable material. Take special precautions at corners.

1.08 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate work with other operations and installations of materials to avoid damage to installed materials.

C. Follow manufacturers guidelines for field conditions.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting self-supporting over structural members.
    1. Flat Sheet Thickness: 1/2 inch, minimum. Build up countertop edge to 1".
    2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and

capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    a. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    b. Window sills: 1/2 inch (13 mm) thick, solid surfacing, edge details as indicated.
    c. Color and Pattern: As indicated on drawings.
    d. Manufacturers:
        1) Wilsonart: www.wilsonart.com
        2) Substitutions: See Section 01 6000 - Product Requirements.
3. Other Components Thickness: 1/2 inch, minimum.
4. Fabricate in accordance with manufacturer's standard requirements.
5. Americans with Disabilities Act (ADA)-Compliant Vanity and Countertop Brackets:
    a. Products:
        1) A&M Hardware, Inc; ADA Vanity Brackets: http://www.aandmhardware.com.
        2) Color: White
        3) Size: To suit application
        4) Type: EC/C Flat Concealed
    b. Substitutions: See Section 01 6000 - Product Requirements
        1) Note: Contractor to verify BABAA compliance with countertop and bracket provider.

B. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz resin over continuous substrate.
1. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    a. Manufacturers:
        1) Wilsonart: www.wilsonart.com
        2) Substitutions: See Section 01 6000 - Product Requirements.
    b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
    c. Finish on Exposed Surfaces: Polished.
    d. Color and Pattern: As indicated on drawings.
2. Back and End Splashes: As indicated on drawings.
3. Fabricate in accordance with manufacturer's standard requirements.

2.02 MATERIALS

A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

C. Joint Sealant: Mildew-resistant silicone sealant, Color as selected by Architect from manufacturer's standard range..

D. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.
2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide backsplash wherever counter edge abuts vertical surface unless otherwise indicated.

1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
2. Height: 4 inches, unless otherwise indicated.

C. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings.

D. Mechanically fasten back splash to countertops with steel brackets at 16 inches (400 mm) on center.

E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 13 3419
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufacturer-engineered, shop-fabricated structural steel building frame.

B. Insulated Metal wall and roof panels including soffits and gutters and downspouts.

C. Exterior doors, windows, overhead doors, and louvers.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications.

B. Section 07 9200 - Joint Sealants: Sealing joints between accessory components and wall system.

C. Section 08 1113 - Hollow Metal Doors and Frames.

D. Section 08 3613 - Sectional Doors.

E. Section 08 5113 - Aluminum Windows.

F. Section 08 5123 - Steel Windows.

G. Section 08 5200 - Wood Windows.

H. Section 08 5313 - Vinyl Windows.

I. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. AISC 360 - Specification for Structural Steel Buildings.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

F. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

I. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.

J. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

K. ASTM C1224 - Standard Specification for Reflective Insulation for Building Applications.

L. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

M. ASTM C1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.

N. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

O. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.

P. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

Q. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

R. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

S. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.

T. AWS D1.1/D1.1M - Structural Welding Code - Steel.

U. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems.

V. MBMA (MBSM) - Metal Building Systems Manual.

W. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components.

X. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

Y. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).

Z. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on profiles, component dimensions, _____.

C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, and loads; wall and roof system dimensions, panel layout, general construction details, anchors and methods of anchorage, _____, and installation; framing anchor bolt settings, sizes, locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.

D. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.

E. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.

F. Designer's Qualification Statement.

G. Manufacturer's Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.

H. Erector's Qualification Statement.

I. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

J. Project Record Documents: Record actual locations of concealed components and utilities.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this type of work.
   1. Design Engineer Qualifications: Licensed in the State in which the Project is located.

2. Comply with applicable code for submission of design calculations as required for acquiring permits.

B. Perform work in accordance with AISC 360, MBMA (MBSM), and _____.
   1. Maintain one copy on site.

C. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
   1. Not less than three years of documented experience.
   2. Accredited by IAS in accordance with IAS AC472.

D. Erector Qualifications: Company specializing in performing the work of this section with minimum 3 years' experience.

E. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five-year period after Date of Substantial Completion.

C. Provide five-year manufacturer warranty for _____.
   1. Include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Buildings Systems:
   1. Butler Manufacturing Company; ____: www.butlermfg.com/#sle.
   2. Chief Buildings; ____: www.chiefbuildings.com/#sle.
   3. Nucor Building Systems; _____: www.nucorbuildingsystems.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ASSEMBLIES

A. Single span rigid frame.

B. Bay Spacing: As indicated on drawings.

C. Primary Framing: Rigid frame of rafter beams and columns, canopy beams and end wall columns, and wind bracing.

D. Secondary Framing: Purlins and Girts, and other items detailed.

E. Wall System: Preformed metal panels of horizontal profile, with sub-girt framing/anchorage assembly, and accessory components.

F. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, insulation, and liner panels, and accessory components.

G. Roof Slope: 1/2 inches in 12 inches.

2.03 PERFORMANCE REQUIREMENTS

A. Installed Thermal Resistance of Wall System: R-value of ____.

B. Installed Thermal Resistance of Roof System: R-value of ____.

C. Design structural members to withstand loads indicated on construction drawings.

D. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of 1/180 of span.

E. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.

2.04 MATERIALS - FRAMING

A. Structural Steel Members: ASTM A36/A36M.

B. Structural Tubing: ASTM A500/A500M Grade B cold-formed.

C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.

D. Anchor Bolts: ASTM F1554, Grade 36, Class 1A, with no preference for protective coating.

E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.

F. Welding Materials: Perform in accordance with AWS D1.1/D1.1M.

G. Primer: SSPC-Paint 20 zinc rich.

H. Grout: ASTM C1107/C1107M; non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
   3. Height Change, Plastic State: When tested in accordance with ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.

2.05 MATERIALS - WALLS AND ROOF

A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.

B. Insulation: Semi-rigid glass fiber type, unfaced, ASTM E84 Class A, flame spread index of 25 or less where exposed, friction fit, ____ inches thick.

C. Insulation: ASTM C665 Type I; ____ inches thick.
   1. Facing: Sheet vinyl, ____ inch thick, white.

D. Metal Building Type, Factory Applied, Vapor-Barrier Insulation Facings: Water vapor permeance no greater than 0.10 perm when tested in accordance with ASTM E96/E96M; flame spread index of 25 or less, and smoke developed index of 40 or less when tested in accordance with ASTM E84.

E. Metal Building Type, Rigid Cellular Polyisocyanurate (ISO) Thermal Insulation Board with Facers Both Sides: Complying with ASTM C1289.
   1. Type I: Faced with aluminum foil on both major surfaces of core foam.
      a. Class 2 - Glass fiber reinforced or nonreinforced core foam.
      b. Compressive Strength: 16 psi, minimum.
      c. Thermal Resistance, R-value: 9.0, minimum, at 1-1/2-inch thickness and 75 degrees F.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Comply with fire-resistance requirements indicated on drawings as part of non-loadbearing exterior wall assembly when tested in accordance with NFPA 285.
   5. Board Size: 48 by 96 inches.
   6. Board Thickness: 1.5 inches.
   7. Board Edges: Square.

F. Joint Seal Gaskets: Manufacturer's standard type.

G. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M, finish to match adjacent surfaces when exterior exposed.

H. Bituminous Paint: Asphaltic type.

I. Sealant: Manufacturer's standard type.

J. Metal Mesh: Galvanized steel wire, woven.

K. Roof Curbs: Insulated metal same as roofing, ____ inch thick, designed for imposed equipment loads, anchor fasteners to equipment, counterflashed to metal roof system.

L. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Rain Water Diverter, Fascias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.06 COMPONENTS

A. Doors and Frames: Manufacturer's standard.

B. Doors and Frames: See Section 08 1113.

C. Overhead Doors: See Section 08 3613.

D. Overhead Door Frame: Formed steel sections braced to building frame; see Section 05 5000.

E. Overhead Doors and Frames: Manufacturer's standard.
   1. Glass and Glazing: See Section 08 8000.

F. Retrofit Insulation System:
   1. Type: Reflective bubble insulation.
   2. Thickness: 5/16 inch.
   3. Facing: Metalized film on both sides.
   4. Edges: Integrated taped tab.
   5. Integral Vapor Retarder: Permeance less than 1.0 perm when measured in accordance with ASTM E96/E96M.
   6. Surface Burning Characteristics: Measured in accordance with ASTM E84.
      a. Metalized Face Both Sides: Flame spread index (FSI) of 25, maximum, Class A, and smoke development index (SDI) of 50 maximum.
      b. Metalized Face One Side: Flame spread index (FSI) of 25, maximum, Class A.
         1) Full Room Fire Rating: Comply with NFPA 286, Class A.
   7. Insulation Value: ASTM C1224, ASTM C1363, when attached to bottom of 6-inch purlin.
      a. Metalized Face Both Sides:
         1) Heat Flow from Outside to Inside, R-value: 16.
         2) Heat Flow from Inside to Outside, R-value: 4.7.
         3) Heat Flow from Horizontally, R-value: 5.4.
      b. Metalized Face One Side:
         1) Heat Flow from Outside to Inside, R-value: 12.
         2) Heat Flow from Inside to Outside, R-value: 4.
         3) Heat Flow from Horizontally, R-value: 4.4.
   8. Attachment: Utilize manufacturer's recommended clip and pin.
   9. Products:
      a. Fi-Foil Company, Inc; Retroshield: www.fifoil.com/#sle.
      b. _____.
      c. _____.
      d. Substitutions: See Section 01 6000 - Product Requirements.

G. Windows: See Section 08 5200.

H. Windows: Manufacturer's standard.
   1. Glass and Glazing: See Section 08 8000.

I. Unit Skylight: See Section 08 6200.

J. Unit Skylight: Manufacturer's standard.
   1. Single Dome: Acrylic plastic, ____ inch thick; clear.
   2. Double Dome: Acrylic plastic, ____ inch thick; air seal the space:
      a. Outer Dome: Clear.
      b. Inner Dome: Clear.
   3. Nominal Size: ___ inch by ___ inch per unit.

4. Configuration: Single units.
5. Shape: Convex.
6. Unit Frame: Extruded aluminum thermally broken, integral curb frame and counterflashing, with integral condensation drainage gutter.
7. Support Curb: Aluminum sandwich construction; ____ inch thick, ____ inch high, fibrous glass insulated, with flange for anchorage to roof deck, counterflashed and formed to roofing metal.

K. Ventilators: Sheet steel, galvanized, rotary design, ____ inch nominal size.

L. Wall Louvers: _____ type Z blade design, same finish as adjacent material, with steel mesh bird screen and frame, blank sheet metal at unused portions.

2.07 FABRICATION - FRAMING

A. Fabricate members in accordance with AISC 360 for plate, bar, tube, or rolled structural shapes.

B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.

C. Provide framing for skylight openings.

D. Provide wall opening framing for doors, windows, and other accessory components.

2.08 FABRICATION - WALL AND ROOF PANELS

A. Siding: Minimum ____ inch metal thickness, ____ profile indicated, ____ inch deep, lapped edges fitted with continuous gaskets.

B. Roofing: Minimum ____ inch metal thickness, ____ profile, lapped edges fitted with continuous gaskets.

C. Liner: Minimum ____ inch metal thickness, flat profile indicated, lapped V edges fitted with continuous gaskets.

D. Soffit Panels: Minimum ____ inch metal thickness, flat profile indicated, perforated for ventilation.

E. Girts/Purlins: Rolled formed structural shape to receive siding, roofing and liner sheet.

F. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles. Back brace mitered internal corners with ____ inch thick sheet.

G. Expansion Joints: Same material and finish as adjacent material where exposed, ____ inch thick, manufacturer's standard brake formed type, of profile to suit system.

H. Flashings, Closure Pieces, Fascia: Same material and finish as adjacent material, profile to suit system.

I. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.

2.09 FABRICATION - GUTTERS AND DOWNSPOUTS

A. Fabricate of same material and finish as roofing metal.

B. Form gutters and downspouts and scuppers of _____ profile and size indicated to collect and remove water. Fabricate with connection pieces.

C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.

D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.10 FINISHES

A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.

B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, _____ color as selected from manufacturer's standard range.

C. Interior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, _____ color as selected from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.02 ERECTION - FRAMING

A. Erect framing in accordance with AISC 360.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.

C. Set column base plates with non-shrink grout to achieve full plate bearing.

D. Do not field cut or alter structural members without approval.

E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION - WALL AND ROOF PANELS

A. Install in accordance with manufacturer's instructions.

B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.

C. Fasten cladding system to structural supports, aligned level and plumb.

D. Locate end laps over supports. End laps minimum 2 inches. Place side laps over bearing.

E. Provide expansion joints where indicated.

F. Use concealed fasteners.

G. Install insulation and vapor retarder utilizing _____ for attachment. Place wire mesh under vapor retarder for support between framing members.

H. Install sealant and gaskets, providing weather tight installation.

3.04 ERECTION - GUTTERS AND DOWNSPOUTS

A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.

B. Apply bituminous paint on surfaces in contact with cementitious materials.

C. Slope gutters minimum ____ inch/ft.

D. Connect downspouts to storm sewer system.

E. Install splash pans under each downspout.

3.05 ERECTION - SKYLIGHTS

A. Install in accordance with manufacturer's instructions.

B. Coordinate with installation of roofing system and related flashings.

C. Apply bituminous paint on aluminum surfaces of units in contact with dissimilar metals.

D. Seal between skylight units and roof system, providing weather tight installation.

3.06 INSTALLATION - ACCESSORY COMPONENTS IN WALL SYSTEM

A. Install door frames, doors, overhead doors, insulation, and windows and glass in accordance with manufacturer's instructions.

3.07 TOLERANCES

A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.

B. Siding and Roofing: 1/8 inch from true position.

END OF SECTION

DIVISION 21 - FIRE SUPPRESSION

SECTION 210100 - GENERAL PROVISIONS

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

This Section pertains to general provisions and requirements for construction of work specified in all sections of Division 21 herein.

"Contractor" referred to in this Section of the specification implies the Contractor, Subcontractor and/or Subcontractors which are responsible for all or any part of the mechanical installation specified in Division 21 and/or as shown on the Contract Drawings.

Where the specifications in subsequent Sections of Division 21 conflict with requirements of this Section, the specifications in the subsequent Sections shall govern.

The Contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled on the Drawings and/or herein specified, including all labor, materials, equipment, accessories, wiring and incidentals necessary to be installed in accordance with manufacturer's recommendations except as otherwise approved.

1.02 PERMITS AND SERVICE CHARGES:

All permits and service charges necessary for execution of the work under this Contract shall be obtained by and be paid for by the Contractor. It shall be the responsibility of the Contractor to determine the permit requirements of the local authorities and utility companies and the cost of required permits, service charges, tap fees and development fees shall be included in the Contractor's bid.

All work shall be executed in accordance with all local, state and national rules, regulations, codes, etc., which are applicable and shall be subject to inspection by the proper authorities.

1.03 CODES AND STANDARDS:

All work performed and all equipment furnished under this Division of the Contract shall be manufactured and installed in strict accordance with all applicable codes and standards, including the applicable provisions of the following codes and standards.

1. Local and State Codes, Standards and Regulations.
2. National Fire Protection Association (NFPA).
3. National Electric Code (NEC).
4. Underwriter's Laboratory (UL).
5. American Gas Association (AGA) Standards.
6. International Plumbing Code.
7. International Mechanical Code.
8. ASME Boiler and Pressure Vessel Codes.
9. American Water Works Association (AWWA).

10. National Sanitation Foundation (NSF).
11. Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA).
12. International Building Code.
13. Life Safety Code.
14. Americans with Disabilities Act (ADA).

All materials installed shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255 and UL 723 not to exceed 25 Flame Spread and 50 Smoke Developed.

1.04 COMPLIANCE:

Where specific requirements of any code vary with the requirements of another code, the higher standard as determined by the Architect/Engineer shall govern the installation.

All equipment manufactured in accordance with the provisions of the above codes and standards shall bear the label of the respective association bureau thereon.

1.05 DRAWINGS:

In general, the Drawings of the mechanical systems and equipment are to scale. However, to determine exact locations of walls and partitions, the Contractor shall consult the architectural and/or structural drawings which are dimensioned. Drawings shall not take precedence over field measurements.

Drawings of piping and ductwork, although shown on scale drawings, are diagrammatic only. They are intended to indicate size and/or capacity where stipulated, approximate location and/or direction, and approximate general arrangement of one phase of work to another, but not the exact detail or exact arrangement of construction. If it is found, before installation of any or all construction phases, that a more convenient, suitable or workable arrangement of any or all phases of the project would result by varying or altering the arrangement indicated on the Drawings, the Architect/Engineer may require the Contractor to change the location or arrangement of the work without additional cost to the Owner. Such rearrangement shall be in accordance with directions from the Architect/Engineer.

Where discrepancies are discovered after certain portions or phases of the work have been installed, the Architect/Engineer reserves the right to require the Contractor to make changes in pipe, duct, fixture or equipment locations or arrangements to avoid conflicts with work at no additional cost to the Owner.

Because the Drawings are to a relatively small scale to show as large a portion as is practical, the fact that only certain features of the system are indicated does not mean that other similar or different features or details will not be required. The Contractor shall furnish all incidental labor, material or equipment for the systems so that each system is a complete and operating one unless otherwise specifically stipulated in the detailed body of the specifications.

The Contractor, Subcontractor's and their respective trades shall cooperate in laying out their work so it will fit properly into the space provided. Promptly report to the Architect/Engineer any delay or difficulties encountered in the installation of this work which might prevent prompt and proper installation, or make it unsuitable to connect with or receive the work of others. Failure to so report

shall constitute an acceptance of the work of other trades as being fit and proper for the execution of this work.

1.06 SUBSTITUTIONS AND PRODUCT OPTIONS:

The Contractor and equipment suppliers shall read and familiarize themselves with articles concerning substitution of materials, as indicated in the Instructions to Bidders. Material and equipment substitutions will be handled as follows:

Materials or equipment specified by name of manufacturer, brand, trade name or catalog reference, shall be furnished under the contract unless changed by Addenda or a Contract modification. Where two (2) or more materials are named, the choice of these shall be optional with the Contractor.

Material or equipment followed by the phrase "or equal" shall establish a standard of required function, dimension, appearance and quality to be met by any proposed substitute. No substitution will be considered unless written request for substitution has been submitted by the bidder and has been received by the Architect/Engineer at least ten days prior to the date for receipt of bids. The Architect/Engineer's decision on a proposed substitute shall be final. If the Architect/Engineer considers any proposed substitution equal, such will be set forth in an Addendum. Bidders shall not rely upon substitutions made in any other manner.

Should the Contractor wish to use materials or equipment other than those specified or listed as equal by Addenda, he shall attach his proposed substitution along with the appropriate add or deduct to the Contract amount, should the substitution be accepted. Substitutions proposed by the Contractor will not be considered in the award of the Contract.

1.07 SHOP DRAWINGS:

Refer to the requirements of the General Conditions. Unless indicated otherwise in the General Conditions, submit to the Architect/Engineer one electronic copy of Shop Drawings for each item of equipment to be installed under this contract. Furnish additional Shop Drawings as required for coordination with General Contractor and other Subcontractors.

To the extent practical, complete sets of shop drawings for each specification section shall be submitted. In the case that a particular item is required to be expedited, that particular item may be submitted individually.

Submit shop drawings punched in PDF format.

Furnish Shop Drawings as follows:

1. For all major items of equipment or materials, regardless of whether the item is to be furnished as specified.
2. For all equipment, systems or devices where Shop Drawings are specifically called for.
3. For all minor items of equipment or materials where the Contractor proposes to deviate from the specified and/or scheduled manufacturer or material.

The Contractor shall check all Shop Drawing submittals for size, capacity, arrangement, connection locations, materials, finish, color, electrical characteristics, accessories, and shall so note the Shop

Drawings prior to submittal to the Architect/Engineer. Any deviation from the Drawings and Specifications shall be indicated.

Shop Drawings will be reviewed by the Architect/Engineer, and copies of Shop Drawings will be returned to the Contractor. Shop Drawings shall be submitted sufficiently in advance of the construction schedule to allow time for checking Drawings, resubmittal and rechecking when necessary.

Any equipment or material which is installed without authorization by properly processed Shop Drawings will be subject to removal by the Contractor and reinstallation as directed, without cost to the Owner. All cost for repair for damages as may be incurred to the structure as a result of the above correction shall be paid by this Contractor.

Shop drawing material quantities will not be checked by the Architect/Engineer, and review of Shop Drawings by the Architect/Engineer shall not be construed to be verification of the material quantities and sizes shown on the Shop Drawings. Quantities, sizes, dimensions and locations shown on the Drawings and as specified shall determine material requirements.

1.08 CLEANING:

The Contractor and/or Subcontractors for the various phases of the work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished under any or all contracts in a clean first class condition.

Permanent heating and ventilating systems shall not be used during the construction period unless the project site is in a clean and dust free condition and shall be subject to the approval of the Architect/Engineer and Owner.

Surfaces of all mechanical equipment shall be wiped clean or washed if required, leaving the installation in a first class condition.

All equipment shall be thoroughly cleaned of all plaster, stickers, rust stains, and other foreign matter or discoloration, leaving every part in a first class condition and ready for use.

1.09 PAINTING:

Painting of materials and equipment furnished under the mechanical portion of the contract shall be as described in Division 9 - FINISHES. Contractor shall refinish and restore to the original condition and appearance, all mechanical equipment which has sustained damage to the manufacturer's prime and finish coats of enamel or paint. Materials and workmanship shall be equal to the requirements described in Division 9 - FINISHES.

1.10 RECORD DRAWINGS:

The Contractor shall keep a complete set of all mechanical drawings in the jobsite office for purpose of showing the installation of mechanical systems and equipment. This set of drawings shall be used for no other purpose. Where any materials equipment or system components are installed different from that shown on the Architect/Engineer's drawings, such differences shall be clearly and neatly shown on this set of drawings using ink or indelible pencil. At the completion of the project,

the record set of drawings shall be turned over to the Architect/Engineer and shall become his property.

1.11 OPERATING INSTRUCTIONS:

The Contractor shall furnish the Owner two (2) sets of complete catalog data, manufacturer's literature and detailed manuals covering the operation and maintenance of all equipment specified under this Division. All such literature shall be bound in an amply sized three-ring binder and submitted to the Architect/Engineer for approval and for eventual transmittal to the Owner. The manual shall have a Table of Contents at the front of the manual.

The Contractor shall also supervise the initial operation of all equipment and instruct the operator selected by the Owner in such operation as required to acquaint him thoroughly with the equipment.

1.12 DELIVERY AND STORAGE OF MATERIALS:

Make provisions for delivery and safe storage of materials on the jobsite and make arrangements with other Contractors for introduction into the building of equipment too large to pass through finished openings. Materials to be delivered at such stages of the work as will expedite the work as a whole and marked and stored in such a way as to be easily checked and inspected. All stored equipment shall be protected from the weather conditions and construction debris with a protective covering securely tied in place.

1.13 MECHANICAL PROVISIONS:

Mechanical equipment shall operate without objectionable noise or vibration, as determined by the Architect/Engineer. If such noise or vibration should be produced and transmitted to occupied portions of the building by apparatus, piping, or other parts of the work, make necessary changes and additions, as approved, without extra cost to Owner.

Provide oil level gauges, grease cups and grease gun fittings for machinery bearings as recommended by the manufacturer. Extend oil or grease fittings by copper tubing to readily accessible locations.

1.14 CONCRETE BASES:

Concrete bases are required for floor mounted mechanical equipment inside buildings and are specified in Division 3 - CONCRETE. After bases are poured they shall set at least seven (7) days before mounting equipment. The Contractor shall coordinate the setting of expansion bolts in the bases for attachment of equipment and/or isolators.

This Contractor shall verify and coordinate the exact location of the bases and the exact size requirements for specific items of equipment.

1.15 COORDINATION OF WORK:

The Contractor shall process shop drawings and order equipment and materials expeditiously after receiving the Contract and the mechanical installation shall be substantially complete when the general construction work is completed. This Contractor shall confer and cooperate with all other Contractors on this project and shall arrange his work in proper relation to the work of others. Each Contractor shall furnish, install, and maintain in place all anchors, inserts, sleeves, etc., required for

his work. Each Contractor will also be held solely responsible for proper size and location of all anchors, inserts, sleeves, chases, recesses, openings, bases, etc., required for proper installation of his work. All cutting and patching made necessary by failure or neglect to coordinate with other Contractors shall be the responsibility of this Contractor. Any cutting or patching shall be subject to the direction and approval of the Architect/Engineer and all damage due to cutting or patching shall be repaired by this Contractor.

After being instructed by this Contractor to do so, the General Contractor will leave all openings in roof, walls, floors, etc., for the passage of pipes, etc. The General Contractor shall also provide concrete bases and roof curbs where shown for mounting the mechanical equipment unless specified otherwise. This Contractor shall verify the exact size and location required for installation of his equipment with the General Contractor.

In general, the Division 26 – Electrical Contractor will provide all power wiring and make one power connection to each item of mechanical equipment, as outlined under Electrical Section.

1.16 GUARANTEE:

All mechanical equipment including equipment used during construction for temporary purposes shall be guaranteed for a period of one year after the time of final acceptance of this work and shall be in like new condition at time of final acceptance.

1.17 ELECTRICAL:

Electric Motors:

All electric motor driven equipment being furnished and installed under Division 21 of these specifications shall be complete with electric motors, unless specified otherwise.

All electric motors shall be as manufactured by Westinghouse, Century, Wagner, Allis Chalmers, Reliance, General Electric, or equal. Bearings shall be ball type with alemite lubricating fittings extended to an easily accessible location for field servicing. Minimum service factors for all motors shall be 1.15. All motors shall conform to applicable NEMA standards and all motors specified for use in hazardous locations shall bear the stamp of approval of the Underwriter's Laboratories. All motors, except direct connected motors, shall be furnished complete with cast iron or stamped steel adjustable slide rails. Single phase motors shall be capacitor start type, drip proof, unless specified otherwise. All motors shall be single speed and shall operate at 1,750 RPM, unless specified otherwise.

Horsepower Rating: All electric motors shall be sized to meet the horsepower requirements of the driven unit at design characteristics including all V-belt and/or drive and coupling losses which are incurred without loading the motor beyond its nameplate horsepower rating. Where V-belt drives are employed, the motor horsepower nameplate ratings shall not be less than 120 percent of the driven unit brake horsepower requirements.

Single Phase Motors: Unless specifically noted otherwise, all electric motors shall be designed for operation in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on Drawings or specified, 60 cycle alternating current. Motors shall be thermally protected.

Three Phase Motors: All electric motors shall be designed for operating in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on Drawings or specified, 60 cycle alternating current.

All motors less than 3/4 horsepower shall be 115 volt, single phase unless designated otherwise and all motors 3/4 horsepower and larger shall be as specified in the specific section or as noted on the Drawings.

Two Speed Motors:

Two speed motors shall have two separate windings.

Premium Efficiency Motors:

Premium efficiency motors shall be furnished on all mechanical equipment where 1 horsepower or larger motors are required.

Motors shall be designed with special stator steel for reduced core losses. Windings shall be oversized copper placed for maximum efficiency. Stator and rotor shall be extra long to reduce flux losses. Frame shall be ODP (unless specified otherwise) of cast iron or cast aluminum construction.

Motors shall be squirrel cage, horizontal base mount, ball bearing, NEMA B design, Class B design, Class B insulation, continuous duty, 1.15 SF, 40 degrees C. ambient.

Minimum nominal full load motor efficiencies shall be based on ASHRAE Standard 90 (latest edition).

Furnish and install Aegis SGR, or equal, maintenance free, circumferential, conductive micro fiber shaft grounding rings on all AC motors controlled by adjustable frequency drives to discharge shaft currents to ground.

Motors shall be similar to Louis Allis "Spartan" Series, Gould "E-Plus" Series, or Westinghouse "MAC II" Series. Manufacturer shall furnish proof of efficiency rating.

Motor Starters:

Except where specifically described as being furnished as a part of the equipment furnished and installed under Division 21 of these specifications, all motor starters will be furnished and installed under Division 26, ELECTRICAL.

Electrical Wiring:

Except where specifically described as being furnished as a part of the equipment furnished and installed under Division 21, all electric power wiring shall be furnished and installed in Division 26, ELECTRICAL. The Electrical Contractor will make one power connection to each item of mechanical equipment, unless specified otherwise.

Electrical wiring furnished and installed under these specifications shall conform to all applicable requirements of Division 26, ELECTRICAL.

Unless otherwise indicated, all motors and controls shall be furnished, set in place and wired in accordance with the following schedule:

Item	Division Furnished Under	Set in Place or Mounted Under	Division Wired & Connected Under
Equipment Motors	21	21	26
Magnetic Motor Starters:			
Automatically controlled, with or without HOA switches	26	26	26
Automatically controlled, with or without HOA switches and furnished as part of factory wired equipment	21	21	26
Manually controlled	26	26	26
Manually controlled and furnished as part of factory wired equipment	21	21	26
Motor valves, Solenoid valves, EP and PE switches, etc.	21	21	21
Alarm bells	21	21	21
Control circuit feeders	26	26	26
Low voltage controls, valves, etc.	21	21	21
Fire protection controls	21	21	26

Heat tape	26	26	26
Disconnect switches, thermal overload switches, manual operating switches	26	26	26
Multi-speed switches	21	26	26
Contactors	26	26	26
Control relays, transformers	21	26	26

NOTES:

(1) Wiring from alarm contacts to alarm system shall be by the Division 26 Contractor; control function wiring shall be by the Division 21 Contractor.

All control wiring and controls as noted on the Drawings and/or as specified in these specifications shall be provided by this Contractor, including items set in place and wired and connected by the Division 26 Contractor, unless specifically shown otherwise on the Drawings.

1.18 SLEEVES:

Any pipe passing through building construction including walls, floors, roofs or masonry partitions or as noted on the Drawings shall be encompassed with sleeves in accordance with the following:

All pipe sleeves through slabs, floors, masonry walls and masonry partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.

Sleeves shall be provided in all masonry partition walls including locations above suspended ceilings where masonry partition walls extend from floor slab to slab above. Sleeves shall be Schedule 40 steel pipe finishing flush with the wall surface.

Sleeves through exterior building walls shall be Schedule 40 steel pipe with welded flange in the middle of the sleeve and ends finishing flush with finished surfaces. Space between pipe and sleeve shall be packed to provide a watertight joint.

Sleeves through roof slabs and floor slabs in concealed locations shall be No. 22 gauge galvanized steel or crete sleeves (linear polyethylene). Concealed sleeves shall be considered as pipe sleeves in shafts, pipe chases and within walls and partitions.

Sleeves through floor slabs in exposed areas shall be Schedule 40 steel pipe and sleeves shall extend 1/4 inch above the finished floor surface. For slabs in equipment rooms and in other wet areas, sleeves shall be Schedule 40 steel pipe and shall extend 2 inches above finished floor surface.

Floor sleeves in membraned floors shall be furnished with flashing rings and clamps.

All sleeves in exposed locations, except equipment rooms, shall be set so plates specified will cover the sleeves.

All pipe sleeves where wet conditions exist, except sleeves through exterior walls, shall be caulked with a plastic caulking, including sleeves in concealed locations. The space between the pipe and the sleeves shall be packed with oakum and approximately 1/2 inch depth of a polyisobutylene
sealer shall be packed or caulked in both ends of sleeve, even with the ends of the sleeve. The sealer shall be suitable for temperatures from minus 50 degrees to 300 degrees, suitable for painting, non-corrosive and have good adhesion.

Sleeves in fire rated construction, equipment rooms, and/or where designated on the Drawings shall consist of 22 gauge galvanized sheet steel with lock seam joints. Seal sleeves with a fire retardant sealant. When applied according to manufacturer's recommendations, sealant shall have a 3-hour U.L. fire rating.

All sleeves required to provide the proper openings in masonry construction for the passage of piping, mechanical equipment, etc., shall be furnished and installed by this Contractor. These sleeves shall also be removed by this Contractor after the opening has been formed. The opening around all equipment, etc., passing through slabs, floors, walls and partitions shall be sealed as specified above for piping.

All sleeves shall be set and maintained in place by this Contractor during the progress of the work. This Contractor shall be responsible for locating all sleeves at the proper location.

Sleeves are not required for core drilled masonry wall and floor holes, masonry wall and floor holes formed by polyethylene plastic (removable) sleeves, or for masonry holes made in another neat manner except in equipment rooms and other wet areas.

Sleeves are not required in metal or wood stud wall construction. Rated systems shall be provided as required to provide the necessary rating of the penetration.

Interior wall sleeves are only required on insulated piping. All other steel or cast iron piping 4 inches and smaller shall be grouted directly into the wall as necessary to provide the required fire and smoke rating. Piping larger than 4 inch size and all non-rated piping shall be provided with a rated system.

Firestopping materials shall be 3M, Hilti, MetaCaulk, Nelson or equal.

1.19 WALL, FLOOR AND CEILING PLATES:

Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. Finished areas shall be those areas which are

painted or have special finishes within the room. The wall plates shall be a minimum of 3/32 inch thickness and shall have set screws or spring locks for clamping to the piping. The plates shall be chrome-plated steel, cast iron or brass and shall set tight against the wall.

1.20 EQUIPMENT SUPPORT:

Furnish and install all necessary wall backing, brackets, braces, plates, angles, wall hangers, etc., required for properly supporting mechanical equipment and mechanical appurtenances. All supports shall be securely anchored with lead inserts, expansion shields, through-going bolts, lag screws or other devices as required.

All items of mechanical equipment hung from overhead structure shall be hung from 2-1/2 inches by 2-1/2 inches by 3/16 inch angles minimum which shall span at least 3 members, unless noted otherwise.

1.21 EXISTING SERVICES:

The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.

All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of the service if possible.

All inactive services which are encountered shall be protected or removed as directed by the Architect/Engineer, Owner, Utility Company or Municipal Agency having jurisdiction. The service shall also be plugged or capped as directed.

When active services must be temporarily interrupted, the interruption shall be scheduled at night or at such time as approved by the Owner or authority having jurisdiction and so as to cause the minimum of interference with establishing operating routine. Arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

1.22 EXCAVATION:

Trenching and excavation for all underground piping and equipment shall be excavated to the required depths. The bottom of the excavation shall be tamped hard and graded to secure the required fill. Bell holes shall be excavated so that pipe will rest on solid ground for its entire length. Rock, where encountered, shall be excavated to a depth of 6 inches below the bottom of pipe and before pipe is laid, the space between bottom of pipe and rock surface shall be filled with gravel. Sewer and water pipes shall be laid in separate trenches, except where otherwise noted and in accordance with applicable codes.

After the piping and equipment have been tested, inspected and approved by the Architect/Engineer and prior to the backfilling, forms shall be removed and the excavation shall be cleaned of trash and debris. Materials for backfilling shall consist of the excavation, or borrow of sand or gravel, and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in thickness, and properly moistened. Backfill inside the building and under any exterior slabs or other paved areas shall be compacted by hand or mechanical means to the density of

95 percent Proctor and areas outside the building not covered by concrete slabs or other structures or pavement shall be compacted to the density of the adjacent undisturbed soil. Any settling within the one (1) year guarantee period shall be repaired at no cost to the Owner.

1.23 ACCESS TO EQUIPMENT:

Access shall be provided to all motors, valves, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The location of the access openings relative to the equipment shall be coordinated to assure proper access to the equipment. The door shall maintain any ratings of the wall, ceiling, etc. that it penetrates.

Access openings are required for valves and other devices requiring access and shall be provided in the housings, tanks, walls, ceilings, etc., under this portion of the Contract.

1.24 PROTECTIVE DEVICES:

All sheaves, belts, drives, couplings, and moving parts shall be protected by approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

All drains, etc. shall have the discharge piped full size to within 6 inches of the floor or floor drain. The piping shall be securely anchored.

1.25 PIPE AND PIPE FITTINGS:

Furnish and install where shown on the Drawings and required to connect equipment, pipe and fittings of type and material for the various services as noted below.

Piping that is not shown on the Drawings, which is obviously necessary for complete systems, shall be provided and shall be amply sized in accordance with applicable codes and standards.

Grooved pipe fittings, valves and couplings shall be Victaulic, Anvil Gruvlok, Central Sprink, Star or equal. All components shall be supplied by one manufacturer.

Plastic piping shall not be used in air plenums or in buildings classified as noncombustible construction unless the piping is rated for installation in air plenums.

The piping for the various systems shall be as follows:

Wet fire sprinkler system piping shall be ASTM A-135 standard-weight, black, Schedule 40 with factory or field formed threaded ends for sizes up to 2 inch size. Fittings used on threaded end piping shall be ASME B16.3 Class 300, ductile iron threaded fittings with NPT threads that conform to ANSI B1.20.1. Wet fire sprinkler piping shall be ASTM A-135 Schedule 10, black with factory or field formed roll-grooved ends for sizes 1-1/2" and greater. Grooved fittings shall be standard or short radius ASTM A-536, Grade 65-45-12, ductile iron fittings with cut-grooved ends and non-lead orange enamel coated. Grooved couplings shall include ductile iron, ASTM A-536, Grade 65-45-12, housings with non-lead orange enamel coatings, ASTM A-449 and ASTM A-183 bolts and nuts, and Grade "E" EPDM Type A gaskets. Grooved pipe outlets shall be tee-let, ASTM A-53, ANSI B1.20.1 threaded or cut groove, factory welded outlet fittings. Field installed outlets shall be

permitted to be mechanical "T", bolted, ASTM A-536, orange enamel coated ductile iron, with ANSI B1.20.1 threaded or cut groove outlets, Grade "E" EPDM gaskets, and ASTM A-449 and ASTM A-183 bolts and nuts.

1.26 VALVES:

Furnish and install valves in piping where so indicated on the Drawings. In addition, shut-off valves shall be provided in piping adjacent to each item of equipment.

All gate and globe valves shall be installed with stem in a vertical position wherever possible.

Of the several manufacturers listed, the Contractor is to standardize on one make as much as practical but not to the extent of sacrificing quality listed. Valves shall be Milwaukee, Crane, Powell, Stockham, Walworth, Victaulic, Grinnell, Anvil Gruvlok, Watts, Nibco, Hammond or equal.

The valves designated in the following schedule are fully described in the valve list following this schedule.

Valve Service	Valve Designation
Shut-Off Valves For:	
Standpipe and Fire Sprinklers	
Pipe sizes 2 in. and smaller	V-1 or V-15
Pipe sizes 2-1/2 in. and larger	V-13 or V-17
Check Valves For:	
Standpipe and Fire Sprinkler	
Pipe sizes 2-1/2 in. and larger	V-18

The following is a list of valves types from which valves for use on this project have been selected. See the valve service schedule preceding this list for types to be used on each service.

(V-1) Ball Valves (Fed. Spec. WW-V-35b,): Bronze body ball valve, conventional port, lever handle, screwed or soldered and teflon seats and stem packing, 150 psi SWP, 400 psi WOG, Milwaukee BA-100 or BA-150, 1/2 inch through 2 inch size. Provide Memory Stop on all valves used for balancing purposes.

(V-13) Butterfly Valve: Wafer or lug type iron body butterfly valve, extended neck, stainless steel shaft, bronze disc, EPT seal and seal with 275 degrees F. temperature rating, lever operated up through 6 inch valve size and gear and crank operator over 6 inch valve size, 150 psi WOG, 2-1/2 inch size and larger Milwaukee "M" series.

(V-15) Butterfly Valve: Full flow, bronze body, threaded or grooved ends, fire protection butterfly valve, 1/2 inch thru 2-1/2 inch size, UL listed, FM approved, slow close operator with position indicator, 175 PSI WWP, Milwaukee Butterball BB-SC Series.

(V-17) Iron Body Gate Valve: Iron body fire protection gate valve, 2-1/2 inch size and larger, UL listed, FM approved, bolted bonnet, outside screw and yoke, solid wedge, flanged ends, 175 psi WWP, 2-1/2 inch size and larger Stockham Fig. G-634.

(V-18) Iron Body Check Valve: Iron body fire protection horizontal swing check valve, UL listed, FM approved, bolted bonnet, renewable seat bronze disc, 175 psi WWP, 2-1/2 inch size and larger, Stockham Fig. G-939.

1.27 PIPING CONNECTIONS:

Furnish and install unions or mating flanges at all connections to each piece of equipment, conveniently located to facilitate quick and easy disconnecting of equipment for replacement or general maintenance. Flanged or union connections shall be used on both sides of equipment connections. Unions or flanges shall be of the same material or finish as the piping systems in which they are installed. Unions are not required for grooved pipe systems.

Grooved pipe and mechanical joint couplings may be utilized in certain piping systems with Architect/Engineer approval. See section on pipe and pipe fittings.

1.28 FLEXIBLE CONNECTORS:

Furnish and install flexible connectors on all piping connections to rotating equipment such as pumps, compressors, etc., and where shown on the Drawings. Flexible connectors shall also be installed at all locations where necessary to prevent damaging stresses to piping, equipment, or building structure, and where necessary to isolate noise at its source.

Flexible connectors shall be installed in strict accordance with manufacturer's recommendations and shall be constructed of material specified herein, unless recommended otherwise by the manufacturer for specific applications. All piping shall be anchored to prevent elongation or compression of the flexible connectors.

Flexible Connectors shall be Kinetics, Proco, Mercer, Flexonics, Twin City Hose, Inc. or equal.

1.29 PIPE HANGERS, SUPPORTS AND ANCHORS:

Anchors as shown and detailed on the Drawings and specified herein and/or as required. All support components shall conform to Manufacturer's Standardization Society Specification SP-58. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustment to maintain pitch required for proper drainage. They shall allow for expansion and contraction of the piping. Hangers shall bear directly on piping.

Hangers shall be constructed of malleable or wrought iron unless noted otherwise, and hangers supporting copper pipe shall be copper plated. Hangers for pipe 3 inches and smaller shall be band and socket Michigan Model No. 100 or equal. For piping over 3 inches, hangers shall be adjustable, Clevis type, Michigan Model No. 400 or equal.

Where groups of three or more pipes occur, they may be supported with trapeze hangers using two hangers as specified with a capped pipe cross member.

Where clearance between pipe and overhead support is insufficient for the use of other hangers specified, use Michigan Model No. 605 or equal.

Horizontal steel or cast iron piping shall be supported as follows:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1-1/4 inch	3/8 inch	8 feet
1-1/2 inch & 2 inch	3/8 inch	10 feet
2-1/2 inch & 3-1/2 inch	1/2 inch	15 feet
4 inch & 5 inch	5/8 inch	15 feet
6 inch	3/4 inch	17 feet
8 inch through 12 inch	7/8 inch	22 feet

Horizontal copper piping shall be supported as follows:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1 inch	3/8 inch	6 feet
1-1/4 inch & 1-1/2 inch	3/8 inch	8 feet
2 inch	3/8 inch	9 feet
2-1/2 inch	1/2 inch	9 feet
3 inch & 4 inch	1/2 inch	10 feet

For vertical piping, where supports are not indicated on the Drawings, support steel and copper pipe at every other floor, support cast iron soil pipe at every floor and PVC piping at every floor and at 5 feet intervals between floors.

Pipe hangers shall not be attached to the roof deck. Hangers shall be attached to the structure with beam clamps, beam attachment and brackets bolted to joists and beams. Use Michigan Model No. 340 or equal, steel washer plates for pipe supported from steel joist. The Contractor shall endeavor to hang near joist panel joints wherever possible.

Hanging from one pipe to another is prohibited.

Pipe anchors shall consist of heavy steel collars with lugs and bolts for clamping and attaching anchor braces, unless otherwise shown on the Drawings. Anchor braces shall be installed in the most effective manner to secure the desired results, using turnbuckles where required. No supports, anchors, and stays shall be attached in places where they will injure the construction either in installation or by the weight or expansion of the pipe line.

Pipe Hangers shall be Michigan, Grinnell, PHD, B-Line or equal.

1.30 PIPING INSTALLATION:

All pipes shall be round and straight, of required size. Cutting shall be done with proper tools and pipes shall be reamed to full size after cutting.

Piping shall be properly enclosed, supported, guided, anchored, sway braced, connected, tested, cleaned and flushed out and shall be properly protected, where required.

All pipes shall be run with proper grade to provide for easy draining and in group runs where applicable and in a neat and orderly manner, to the satisfaction of the Architect/Engineer. Lines required to be enclosed in ceiling, chaseways or similar spaces shall be installed to permit such enclosure as intended. All pipe runs shall be carefully laid out and scheduled to avoid necessary interferences with other work. Pipe sizes shown on the Drawings are nominal pipe sizes and not outside diameters.

Pipes shall be run substantially as indicated on the Drawings. However, the Architect/Engineer reserves the right to require this Contractor to make changes in pipe locations where conflicts occur with other trades. Such changes shall be made without extra cost to the Owner.

Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Such provision shall be made by means of piping offsets, changes in direction, expansion loops and/or suitable expansion joints. Suitable anchors and guides shall be provided to permit proper deflection and compression of offset loops and expansion joints. Expansion joints shall not be used in lieu of offsets, changes in direction or loops, except where specified and/or indicated on the Drawings or where otherwise obviously necessary.

Exposed piping shall be installed in a sanitary manner for ease in cleaning. Pipe shall be cut and threaded to fit the installation.

1.31 PRESSURE GAUGES:

Furnish and install U.S. Gauge Model 5105 or equal pressure gauges in pipelines and on equipment as indicated herein and/or where shown on the Drawings. Gauges shall have phosphor bronze bourdon tube with brass movement.

Gauges shall be compound, pressure or vacuum as required with 4-1/2 inch diameter dial. Each gauge shall be complete with Trerice No. 872 pressure snubbers, and brass ball valves. Ball valves shall be provided on all gauges.

The normal operating pressure of each gauge shall be 50-70 percent of full scale. The range of the scale shall be suitable for the application.

The gauges shall be located and mounted such that they can be conveniently read by a person standing on the equipment room floor. Accuracy shall be Grade "A". Case shall be aluminum.

Pressure gauges shall be U.S. Gauge, Trerice, Weksler, Ashcroft, Weiss or equal.

END OF SECTION 210100

SECTION 210500 - FIRE SUPPRESSION

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

Section 210100, General Provisions, in its entirety, including references to the General Construction Specifications, are hereby adopted and made a part of these Specifications.

The Work involved in this specification and the accompanying Drawings consists of performing all labor and furnishing of all materials, fixtures and equipment necessary to install a complete fire protection system as described herein and/or shown on the Drawings. This includes all piping, wiring and materials obviously necessary for complete systems though not specifically mentioned or shown.

The fire protection system shall be a wet system. The system in office areas shall be designed for light hazardous classification. The storage and mechanical areas shall be designed for ordinary hazard, group 1 classification. The vehicle storage/garage spaces shall be designed for ordinary hazard, group 2 classification. Provide coverage for all concealed combustible spaces including, but not limited to the attics. The system shall be complete with sprinkler heads, piping, valves, alarm bell, fire department connection and controls necessary for a complete system.

1.02 CONTRACTOR QUALIFICATIONS:

The Contractor for the Fire Protection installation shall be a qualified Fire Protection Contractor regularly engaged in the installation of Automatic Fire Sprinkler Systems and other Fire Protection Equipment.

1.03 AUTHORITIES AND AGENCIES:

All work will be installed for the approval and acceptance of the Fire Chief of the City of Fort Washakie, Wyoming.

All material, equipment, valves and devices installed or furnished under this Section shall be listed or approved for use in the fire protection installation by the authorities, agencies, codes and standards named in this Section of the Specifications:

Underwriters Laboratories - Approved Fire Protection.
NFPA Pamphlet No. 13.
Factory Mutual.

1.04 DESIGN AND INSTALLATION STANDARDS:

The Fire Protection System shall be designed and installed to comply with the following standards and/or codes of the latest issue:

NFPA Pamphlet No. 13 - Sprinkler Systems.
Building Code of the City of Fort Washakie, Wyoming.

1.05 WORKING DRAWINGS:

Before commencing with the sprinkler installation, the Fire Protection Contractor shall submit Working Drawings to the authorities having jurisdiction and agencies specified for review and

approval and/or acceptance. Following approval by authorities and agencies having jurisdiction, the Contractor shall submit the Drawings to the Architect/Engineer in accordance with the General Conditions and Section 210100, GENERAL PROVISIONS - SHOP DRAWINGS.

1.06 INSPECTION AND TESTS:

All inspections, examinations and tests required by the authorities and agencies specified shall be arranged and paid for by the Fire Protection Contractor as necessary, to obtain complete and final acceptance of the Fire Protection System.

1.07 CONTRACTOR'S CERTIFICATE:

After completion of the fire protection installation and at the start of the guarantee year, the Fire Protection Contractor shall execute and file five (5) copies of the "Contractor's Material and Test Certificate, Sprinkler systems - Water Spray Systems" with the Architect. At the time of final inspection the following maintenance shall be performed:

Operation of all control valves.

Lubrication of operation stems of all interior control valves.

Operation of alarm bell.

Cleaning of sprinkler valves.

Lubrication of fire protection inlet water connections.

1.08 PIPE AND PIPE FITTINGS:

Refer to the requirements of Section 210100 - General Provisions, subsection Pipe and Pipe Fittings.

All piping installed in exposed locations shall be designated as such in the Shop Drawing submittals.

1.09 SPRINKLER HEADS:

Sprinkler heads shall be standard semi-recessed chrome-plated pendant type in all locations where piping is concealed above ceilings.

Sprinkler heads shall be standard upright type where piping is installed exposed in warehouse, garage and other locations as indicated on the Drawings. Upright heads shall be plain brass finish.

Sidewall sprinkler heads, where permitted, shall be chrome-plated in finished rooms, plain brass elsewhere.

Flush chrome-plated sprinkler heads shall be installed where noted on the Drawings.

Temperature rating of sprinklers shall be in accordance with requirements of approving authorities and as noted on the Drawings.

Sprinkler heads shall be installed centered in the ceiling tile where applicable. Three locations are acceptable in 2 foot by 4 foot ceiling tiles.

Sprinkler heads installed in areas where damage may occur, such as gymnasiums, shall have head guards.

1.10 WATER FLOW SWITCHES AND ALARMS:

Flow switches for alarm bell shall be furnished, installed and wired by this Contractor. This Contractor shall also furnish, install and wire an exterior sprinkler alarm bell located as shown on the Drawings.

The Division 26 Contractor will make one power connection to the sprinkler alarm system. All other wiring shall be furnished and installed by this Contractor. The Contractor shall also furnish and install the required tamper switches and zone flow switches to be wired to the fire alarm system by DIVISION 26.

1.11 DRAINS:

Main system drain shall be piped to sewer connection or through wall of building to atmosphere where properly trapped sewer connection is not available. Auxiliary drains shall be piped to floor drain where practical or valved and plugged.

1.12 SIAMESE FIRE DEPARTMENT CONNECTION:

Furnish and install a Potter Roemer Series 5020 or equal Siamese connection where shown on the Drawings. Wall plate shall read "AUTOMATIC SPRINKLER." Finish shall be polished brass. Inlets shall be 2-1/2 inch size and outlet shall be 4 inch size. Install an automatic ball drips between the Siamese connection and the check valve.

Siamese connections shall have polished brass caps and chains. Locking Fire Department connection caps shall be provided where required by the fire code official and where the responding fire department carries appropriate key wrenches for removal. Outlets shall be 36 inches above finished grade. Threads for Fire Department connections shall be National Standard. Verify threads and cap type with the local Fire Department.

Fire Department connections shall be Potter Roemer, Central, Seco and Elkhart, or equal.

1.13 DOUBLE CHECK BACKFLOW PREVENTER:

Furnish and install Watts Regulator Co., series No. 007-S, 709-S or equal double check backflow preventers where shown. The backflow preventer shall be a complete assembly including tight closing shut-off valves before and after the device and also be protected by a strainer. It shall be a complete assembly including four ball type test cocks.

The device shall meet the requirements of A.S.S.E. standard 1015 and A.W.W.A. standard C506.

After installation the backflow preventer shall be tested and certified by a licensed technician.

Double Check Backflow Preventer shall be Ames, Watts, Hersey, Conbraco, Febco, Wilkins or equal.

END OF SECTION 210500

DIVISION 22 – PLUMBING AND HEATING

SECTION 220100 - GENERAL PROVISIONS

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

This Section pertains to general provisions and requirements for construction of work specified in all sections of Division 22 herein.

"Contractor" referred to in this Section of the specification implies the Contractor, Subcontractor and/or Subcontractors which are responsible for all or any part of the mechanical installation specified in Division 22 and/or as shown on the Contract Drawings.

Where the specifications in subsequent Sections of Division 22 conflict with requirements of this Section, the specifications in the subsequent Sections shall govern.

The Contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled on the Drawings and/or herein specified, including all labor, materials, equipment, accessories, wiring and incidentals necessary to be installed in accordance with manufacturer's recommendations except as otherwise approved.

1.02 PERMITS AND SERVICE CHARGES:

All permits and service charges necessary for execution of the work under this Contract shall be obtained by and be paid for by the Contractor. It shall be the responsibility of the Contractor to determine the permit requirements of the local authorities and utility companies and the cost of required permits, service charges, tap fees and development fees shall be included in the Contractor's bid.

All work shall be executed in accordance with all local, state and national rules, regulations, codes, etc., which are applicable and shall be subject to inspection by the proper authorities.

1.03 CODES AND STANDARDS:

All work performed and all equipment furnished under this Division of the Contract shall be manufactured and installed in strict accordance with all applicable codes and standards, including the applicable provisions of the following codes and standards.

1. Local and State Codes, Standards and Regulations.
2. National Fire Protection Association (NFPA).
3. National Electric Code (NEC).
4. Underwriter's Laboratory (UL).
5. American Gas Association (AGA) Standards.
6. Uniform Plumbing Code.
7. International Mechanical Code.
8. ASME Boiler and Pressure Vessel Codes.
9. State Boiler Safety Code.
10. American Waterworks Association (AWWA).

11. National Sanitation Foundation (NSF).
12. Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA).
13. International Building Code.
14. Life Safety Code.
15. State Energy Conservation Standards.
16. Americans with Disabilities Act (ADA).

All materials installed shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255 and UL 723 not to exceed 25 Flame Spread and 50 Smoke Developed.

1.04 COMPLIANCE:

Where specific requirements of any code vary with the requirements of another code, the higher standard as determined by the Architect/Engineer shall govern the installation.

All equipment manufactured in accordance with the provisions of the above codes and standards shall bear the label of the respective association bureau thereon.

1.05 DRAWINGS:

In general, the Drawings of the mechanical systems and equipment are to scale. However, to determine exact locations of walls and partitions, the Contractor shall consult the architectural and/or structural drawings which are dimensioned. Drawings shall not take precedence over field measurements.

Drawings of piping and ductwork, although shown on scale drawings, are diagrammatic only. They are intended to indicate size and/or capacity where stipulated, approximate location and/or direction, and approximate general arrangement of one phase of work to another, but not the exact detail or exact arrangement of construction. If it is found, before installation of any or all construction phases, that a more convenient, suitable or workable arrangement of any or all phases of the project would result by varying or altering the arrangement indicated on the Drawings, the Architect/Engineer may require the Contractor to change the location or arrangement of the work without additional cost to the Owner. Such rearrangement shall be in accordance with directions from the Architect/Engineer.

Where discrepancies are discovered after certain portions or phases of the work have been installed, the Architect/Engineer reserves the right to require the Contractor to make changes in pipe, duct, fixture or equipment locations or arrangements to avoid conflicts with work at no additional cost to the Owner.

Because the Drawings are to a relatively small scale to show as large a portion as is practical, the fact that only certain features of the system are indicated does not mean that other similar or different features or details will not be required. The Contractor shall furnish all incidental labor, material or equipment for the systems so that each system is a complete and operating one unless otherwise specifically stipulated in the detailed body of the specifications.

The Contractor, Subcontractor's and their respective trades shall cooperate in laying out their work so it will fit properly into the space provided. Promptly report to the Architect/Engineer any delay or difficulties encountered in the installation of this work which might prevent prompt and proper installation, or make it unsuitable to connect with or receive the work of others.

Failure to so report shall constitute an acceptance of the work of other trades as being fit and proper for the execution of this work.

1.06 SUBSTITUTIONS AND PRODUCT OPTIONS:

The Contractor and equipment suppliers shall read and familiarize themselves with articles concerning substitution of materials, as indicated in the Instructions to Bidders. Material and equipment substitutions will be handled as follows:

Materials or equipment specified by name of manufacturer, brand, trade name or catalog reference, shall be furnished under the contract unless changed by Addenda or a Contract modification. Where two (2) or more materials are named, the choice of these shall be optional with the Contractor.

Material or equipment followed by the phrase "or equal" shall establish a standard of required function, dimension, appearance and quality to be met by any proposed substitute. No substitution will be considered unless written request for substitution has been submitted by the bidder and has been received by the Architect/Engineer at least ten days prior to the date for receipt of bids. The Architect/Engineer's decision on a proposed substitute shall be final. If the Architect/Engineer considers any proposed substitution equal, such will be set forth in an Addendum. Bidders shall not rely upon substitutions made in any other manner.

Should the Contractor wish to use materials or equipment other than those specified or listed as equal by Addenda, he shall attach his proposed substitution along with the appropriate add or deduct to the Contract amount, should the substitution be accepted. Substitutions proposed by the Contractor will not be considered in the award of the Contract.

1.07 SHOP DRAWINGS:

Refer to the requirements of the General Conditions. Unless indicated otherwise in the General Conditions, submit to the Architect/Engineer one electronic copy of Shop Drawings for each item of equipment to be installed under this contract. Furnish additional Shop Drawings as required for coordination with General Contractor and other Subcontractors.

To the extent practical, complete sets of shop drawings for each specification section shall be submitted. In the case that a particular item is required to be expedited, that particular item may be submitted individually.

Submit shop drawings in PDF format.

Furnish Shop Drawings as follows:

1. For all major items of equipment or materials, regardless of whether the item is to be furnished as specified.
2. For all equipment, systems or devices where Shop Drawings are specifically called for.
3. For all minor items of equipment or materials where the Contractor proposes to deviate from the specified and/or scheduled manufacturer or material.

The Contractor shall check all Shop Drawing submittals for size, capacity, arrangement, connection locations, materials, finish, color, electrical characteristics, accessories, and shall so

note the Shop Drawings prior to submittal to the Architect/Engineer. Any deviation from the Drawings and Specifications shall be indicated.

Shop Drawings will be reviewed by the Architect/Engineer, and copies of Shop Drawings will be returned to the Contractor. Shop Drawings shall be submitted sufficiently in advance of the construction schedule to allow time for checking Drawings, resubmittal and rechecking when necessary.

Any equipment or material which is installed without authorization by properly processed Shop Drawings will be subject to removal by the Contractor and reinstallation as directed, without cost to the Owner. All cost for repair for damages as may be incurred to the structure as a result of the above correction shall be paid by this Contractor.

Shop drawing material quantities will not be checked by the Architect/Engineer, and review of Shop Drawings by the Architect/Engineer shall not be construed to be verification of the material quantities and sizes shown on the Shop Drawings. Quantities, sizes, dimensions and locations shown on the Drawings and as specified shall determine material requirements.

1.08 CLEANING:

The Contractor and/or Subcontractors for the various phases of the work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished under any or all contracts in a clean first class condition.

Permanent heating and ventilating systems shall not be used during the construction period unless the project site is in a clean and dust free condition and shall be subject to the approval of the Architect/Engineer and Owner.

Surfaces of all coils, heaters, boilers, pumps and mechanical equipment shall be wiped clean or washed if required, leaving the installation in a first class condition. All throwaway filters used during construction shall be replaced.

All plumbing fixtures shall be thoroughly cleaned of all plaster, stickers, rust stains, and other foreign matter or discoloration, leaving every part in a first class condition and ready for use. The surfaces of all floor drains, cleanouts and other equipment shall be cleaned, and each item shall be left in a first class condition.

1.09 PAINTING:

Painting of materials and equipment furnished under the mechanical portion of the contract shall be as described in Division 9 - FINISHES. Contractor shall refinish and restore to the original condition and appearance, all mechanical equipment which has sustained damage to the manufacturer's prime and finish coats of enamel or paint. Materials and workmanship shall be equal to the requirements described in Division 9 - FINISHES.

1.10 RECORD DRAWINGS:

The Contractor shall keep a complete set of all mechanical drawings in the jobsite office for purpose of showing the installation of mechanical systems and equipment. This set of drawings shall be used for no other purpose. Where any materials equipment or system components are installed different from that shown on the Architect/Engineer's drawings, such differences shall

be clearly and neatly shown on this set of drawings using ink or indelible pencil. At the completion of the project, the record set of drawings shall be turned over to the Architect/Engineer and shall become his property.

1.11 STERILIZATION OF WATER SUPPLY SYSTEM:

All domestic water and site irrigation systems (as applicable) shall be sterilized with sufficient chlorine to provide a dosage of not less than 200 ppm with a contact period of not less than 3 hours, and with all valves in line opened and closed at least three times during the sterilized period. Following the contact period, the water is to be thoroughly flushed from the system until the residual chlorine content is not more than 0.20 ppm.

A certificate of completion shall be provided.

1.12 OPERATING INSTRUCTIONS:

The Contractor shall furnish the Owner two (2) sets of complete catalog data, manufacturer's literature and detailed manuals covering the operation and maintenance of all equipment specified under this Division. All such literature shall be bound in an amply sized three-ring binder and submitted to the Architect/Engineer for approval and for eventual transmittal to the Owner. The manual shall have a Table of Contents at the front of the manual. Before producing hard copies of the manuals, verify with the General Contractor if electronic or hard copy versions of the manuals are to be submitted.

The Contractor shall also supervise the initial operation of all equipment and instruct the operator selected by the Owner in such operation as required to acquaint him thoroughly with the equipment.

1.13 DELIVERY AND STORAGE OF MATERIALS:

Make provisions for delivery and safe storage of materials on the jobsite and make arrangements with other Contractors for introduction into the building of equipment too large to pass through finished openings. Materials to be delivered at such stages of the work as will expedite the work as a whole and marked and stored in such a way as to be easily checked and inspected. All stored equipment shall be protected from the weather conditions and construction debris with a protective covering securely tied in place.

1.14 MECHANICAL PROVISIONS:

Mechanical equipment shall operate without objectionable noise or vibration, as determined by the Architect/Engineer. If such noise or vibration should be produced and transmitted to occupied portions of the building by apparatus, piping, or other parts of the mechanical work, make necessary changes and additions, as approved, without extra cost to Owner.

Provide oil level gauges, grease cups and grease gun fittings for machinery bearings as recommended by the manufacturer. Extend oil or grease fittings by copper tubing to readily accessible locations.

1.15 CONCRETE BASES:

Concrete bases are required for floor mounted mechanical equipment inside buildings and are specified in Division 3 - CONCRETE. After bases are poured they shall set at least seven (7) days before mounting equipment. The Contractor shall coordinate the setting of expansion bolts in the bases for attachment of equipment and/or isolators.

This Contractor shall verify and coordinate the exact location of the bases and the exact size requirements for specific items of equipment.

As applicable, water heaters, water softeners, air compressors, vacuum pumps, boilers, pumps, tanks, indoor chillers and condensers and other floor mounted mechanical equipment shall be mounted on four inch (or as required) high concrete bases.

1.16 COORDINATION OF WORK:

The Contractor shall process shop drawings and order equipment and materials expeditiously after receiving the Contract and the mechanical installation shall be substantially complete when the general construction work is completed. This Contractor shall confer and cooperate with all other Contractors on this project and shall arrange his work in proper relation to the work of others. Each Contractor shall furnish, install, and maintain in place all anchors, inserts, sleeves, etc., required for his work. Each Contractor will also be held solely responsible for proper size and location of all anchors, inserts, sleeves, chases, recesses, openings, bases, etc., required for proper installation of his work. All cutting and patching made necessary by failure or neglect to coordinate with other Contractors shall be the responsibility of this Contractor. Any cutting or patching shall be subject to the direction and approval of the Architect/Engineer and all damage due to cutting or patching shall be repaired by this Contractor.

After being instructed by this Contractor to do so, the General Contractor will leave all openings in roof, walls, floors, etc., for the passage of pipes, etc. The General Contractor shall also provide concrete bases and roof curbs where shown for mounting the mechanical equipment unless specified otherwise. This Contractor shall verify the exact size and location required for installation of his equipment with the General Contractor.

In general, the Division 26 – Electrical Contractor will provide all power wiring and make one power connection to each item of mechanical equipment, as outlined under Electrical Section.

1.17 GUARANTEE:

All mechanical equipment including equipment used during construction for temporary purposes shall be guaranteed for a period of one year after the time of final acceptance of this work and shall be in like new condition at time of final acceptance.

1.18 ELECTRICAL:

Electric Motors:

All electric motor driven equipment being furnished and installed under Division 22 of these specifications shall be complete with electric motors, unless specified otherwise.

All electric motors shall be as manufactured by Westinghouse, Century, Wagner, Allis Chalmers, Reliance, General Electric, or equal. Bearings shall be ball type with alemite lubricating fittings extended to an easily accessible location for field servicing. Minimum service factors for all motors shall be 1.15. All motors shall conform to applicable NEMA standards and all motors

specified for use in hazardous locations shall bear the stamp of approval of the Underwriter's Laboratories. All motors, except direct connected motors, shall be furnished complete with cast iron or stamped steel adjustable slide rails. Single phase motors shall be capacitor start type, drip proof, unless specified otherwise. All motors shall be single speed and shall operate at 1,750 RPM, unless specified otherwise.

Horsepower Rating: All electric motors shall be sized to meet the horsepower requirements of the driven unit at design characteristics including all V-belt and/or drive and coupling losses which are incurred without loading the motor beyond its nameplate horsepower rating. Where V-belt drives are employed, the motor horsepower nameplate ratings shall not be less than 120 percent of the driven unit brake horsepower requirements.

Single Phase Motors: Unless specifically noted otherwise, all electric motors shall be designed for operation in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on Drawings or specified, 60 cycle alternating current. Motors shall be thermally protected.

Three Phase Motors: All electric motors shall be designed for operating in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on Drawings or specified, 60 cycle alternating current.

All motors less than 3/4 horsepower shall be 115 volt, single phase unless designated otherwise and all motors 3/4 horsepower and larger shall be as specified in the specific section or as noted on the Drawings.

Premium Efficiency Motors:

Premium efficiency motors shall be furnished on all mechanical equipment where 1 horsepower or larger motors are required.

Motors shall be designed with special stator steel for reduced core losses. Windings shall be oversized copper placed for maximum efficiency. Stator and rotor shall be extra long to reduce flux losses. Frame shall be ODP (unless specified otherwise) of cast iron or cast aluminum construction.

Motors shall be squirrel cage, horizontal base mount, ball bearing, NEMA B design, Class B design, Class B insulation, continuous duty, 1.15 SF, 40 degrees C. ambient.

Minimum nominal full load motor efficiencies shall be based on ASHRAE Standard 90 (latest edition).

Furnish and install Aegis SGR, or equal, maintenance free, circumferential, conductive micro fiber shaft grounding rings on all AC motors controlled by adjustable frequency drives to discharge shaft currents to ground.

Motors shall be similar to Louis Allis "Spartan" Series, Gould "E-Plus" Series, or Westinghouse "MAC II" Series. Manufacturer shall furnish proof of efficiency rating.

Motor Starters:

Except where specifically described as being furnished as a part of the equipment furnished and installed under Division 22 of these specifications, all motor starters will be furnished and installed under Division 26, ELECTRICAL.

Electrical Wiring:

Except where specifically described as being furnished as a part of the equipment furnished and installed under Division 22, all electric power wiring shall be furnished and installed in Division 26, ELECTRICAL. The Electrical Contractor will make one power connection to each item of mechanical equipment, unless specified otherwise.

Electrical wiring furnished and installed under these specifications shall conform to all applicable requirements of Division 26, ELECTRICAL.

Unless otherwise indicated, all motors and controls shall be furnished, set in place and wired in accordance with the following schedule:

Item	Division Furnished Under	Set in Place or Mounted Under	Division Wired & Connected Under
Equipment Motors	22	22	26
Magnetic Motor Starters:			
Automatically controlled, with or without HOA switches	26	26	26
Automatically controlled, with or without HOA switches and furnished as part of factory wired equipment	22	22	26
Manually controlled	26	26	26
Manually controlled and furnished as part of factory wired equipment	22	22	26
Line voltage thermostats, time clocks,			

etc., not connected to control panel systems	22	26	26
Electric thermostats, time clocks, remote bulb thermostats, motor valves, float controls, etc., which are an integral part or directly attached to ducts, pipes, etc.	22	22	22
Temperature control panels and time switches mounted on temperature control panels	22	22	22
Motor valves, solenoid valves, EP and PE switches, etc.	22	22	22
Alarm bells	22	22	22
Control circuit feeders	26	26	26
Low voltage controls, thermostats, valves, etc.	22	22	22
Fire protection controls	22	22	26
Fire and smoke Detectors	26	26	26[(1)]
Pushbutton stations, pilot lights	26	26	26
Heat tape	26	26	26
Disconnect switches, thermal overload switches, manual operating switches	26	26	26
Multi-speed switches	22	26	26
Contactors	26	26	26

Control relays, transformers	22	26	26

NOTES:

(1) Wiring from alarm contacts to alarm system shall be by the Division 26 Contractor; control function wiring shall be by the Division 22 Contractor.

All control wiring and controls as noted on the Drawings and/or as specified in these specifications shall be provided by this Contractor, including items set in place and wired and connected by the Division 26 Contractor, unless specifically shown otherwise on the Drawings.

1.19 SLEEVES:

Any pipe passing through building construction including walls, floors, roofs or masonry partitions or as noted on the Drawings shall be encompassed with sleeves in accordance with the following:

All pipe sleeves through slabs, floors, masonry walls and masonry partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.

Sleeves shall be provided in all masonry partition walls including locations above suspended ceilings where masonry partition walls extend from floor slab to slab above. Sleeves shall be Schedule 40 steel pipe finishing flush with the wall surface.

Sleeves through exterior building walls shall be Schedule 40 steel pipe with welded flange in the middle of the sleeve and ends finishing flush with finished surfaces. Space between pipe and sleeve shall be packed to provide a watertight joint.

Sleeves through roof slabs and floor slabs in concealed locations shall be No. 22 gauge galvanized steel or crete sleeves (linear polyethylene). Concealed sleeves shall be considered as pipe sleeves in shafts, pipe chases and within walls and partitions.

Sleeves through floor slabs in exposed areas shall be Schedule 40 steel pipe and sleeves shall extend 1/4 inch above the finished floor surface. For slabs in equipment rooms and in other wet areas, sleeves shall be Schedule 40 steel pipe and shall extend 2 inches above finished floor surface.

Floor sleeves in membraned floors shall be furnished with flashing rings and clamps.

All sleeves in exposed locations, except equipment rooms, shall be set so plates specified will cover the sleeves.

All pipe sleeves where wet conditions exist, except sleeves through exterior walls, shall be caulked with a plastic caulking, including sleeves in concealed locations. The space between the pipe and the sleeves shall be packed with oakum and approximately 1/2 inch depth of a polyisobutylene

sealer shall be packed or caulked in both ends of sleeve, even with the ends of the sleeve. The sealer shall be suitable for temperatures from minus 50 degrees to 300 degrees, suitable for painting, non-corrosive and have good adhesion.

Sleeves in fire rated construction, equipment rooms, and/or where designated on the Drawings shall consist of 22 gauge galvanized sheet steel with lock seam joints. Seal sleeves with a fire retardant sealant. When applied according to manufacturer's recommendations, sealant shall have a 3-hour U.L. fire rating.

All sleeves required to provide the proper openings in masonry construction for the passage of ductwork, mechanical equipment, etc., shall be furnished and installed by this Contractor. These sleeves shall also be removed by this Contractor after the opening has been formed. The opening around all ductwork, equipment, etc., passing through slabs, floors, walls and partitions shall be sealed as specified above for piping. Fire/smoke dampers shall be installed in accordance with the manufacturer's installation instructions.

All sleeves shall be set and maintained in place by this Contractor during the progress of the work. This Contractor shall be responsible for locating all sleeves at the proper location.

Sleeves are not required for core drilled masonry wall and floor holes, masonry wall and floor holes formed by polyethylene plastic (removable) sleeves, or for masonry holes made in another neat manner except in equipment rooms and other wet areas.

Sleeves are not required in metal or wood stud wall construction. Rated systems shall be provided as required to provide the necessary rating of the penetration.

Interior wall sleeves are only required on cold insulated piping (cold water, downspout, chilled water supply and return, etc.). All other steel or cast iron piping 4 inches and smaller shall be grouted directly into the wall as necessary to provide the required fire and smoke rating. Piping larger than 4 inch size and all non-rated piping shall be provided with a rated system.

Firestopping materials shall be 3M, Hilti, MetaCaulk, Nelson or equal.

1.20 WALL, FLOOR AND CEILING PLATES:

Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. Finished areas shall be those areas which are painted or have special finishes within the room. The wall plates shall be a minimum of 3/32 inch thickness and shall have set screws or spring locks for clamping to the piping. Specified flush valves shall have set screw type wall plates. The plates shall be chrome-plated steel, cast iron or brass and shall set tight against the wall.

1.21 EQUIPMENT SUPPORT:

Furnish and install all necessary wall backing, brackets, braces, plates, angles, closet carriers, lavatory carriers, urinal carriers, wall hangers, etc., required for properly supporting plumbing fixtures, mechanical equipment and mechanical appurtenances. All supports shall be securely anchored with lead inserts, expansion shields, through-going bolts, lag screws or other devices as required.

All items of mechanical equipment hung from overhead structure shall be hung from 2-1/2 inches by 2-1/2 inches by 3/16 inch angles minimum which shall span at least 3 members, unless noted otherwise.

1.22 EXISTING SERVICES:

The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.

All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of the service if possible.

All inactive services which are encountered shall be protected or removed as directed by the Architect/Engineer, Owner, Utility Company or Municipal Agency having jurisdiction. The service shall also be plugged or capped as directed.

When active services must be temporarily interrupted, the interruption shall be scheduled at night or at such time as approved by the Owner or authority having jurisdiction and so as to cause the minimum of interference with establishing operating routine. Arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

1.23 EXCAVATION:

Trenching and excavation for all underground piping and equipment shall be excavated to the required depths. The bottom of the excavation shall be tamped hard and graded to secure the required fill. Bell holes shall be excavated so that pipe will rest on solid ground for its entire length. Rock, where encountered, shall be excavated to a depth of 6 inches below the bottom of pipe and before pipe is laid, the space between bottom of pipe and rock surface shall be filled with gravel. Sewer and water pipes shall be laid in separate trenches, except where otherwise noted and in accordance with applicable codes.

After the piping and equipment have been tested, inspected and approved by the Architect/Engineer and prior to the backfilling, forms shall be removed and the excavation shall be cleaned of trash and debris. Materials for backfilling shall consist of the excavation, or borrow of sand or gravel, and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in thickness, and properly moistened. Backfill inside the building and under any exterior slabs or other paved areas shall be compacted by hand or mechanical means to the density of 95 percent Proctor and areas outside the building not covered by concrete slabs or other structures or pavement shall be compacted to the density of the adjacent undisturbed soil. Any settling within the one (1) year guarantee period shall be repaired at no cost to the Owner.

1.24 ACCESS TO EQUIPMENT:

Access shall be provided to all motors, valves, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The location of the access openings relative to the mechanical equipment shall be coordinated to assure proper access to the equipment. The door shall maintain any ratings of the wall, ceiling, etc. that it penetrates.

Access openings are required for valves and other devices requiring access and shall be provided in the ductwork, plenums, housings, tanks, walls, ceilings, etc., under this portion of the Contract.

1.25 PROTECTIVE DEVICES:

All sheaves, belts, drives, couplings, and moving parts shall be protected by approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

All pressure and/or temperature relief valves shall have the discharge piped full size to within 6 inches of the floor or floor drain. The piping shall be securely anchored. All relief valves shall be ASME approved and proper size for the application.

1.26 PIPE AND PIPE FITTINGS:

Furnish and install where shown on the Drawings and required to connect fixtures and equipment, pipe and fittings of type and material for the various services as noted below. At all exposed fixture supply connections, nipples are required between copper tubing and fixtures, such nipples shall be standard weight full iron pipe size chrome-plated brass pipe nipples with suitable brass or copper adapters. Steel or iron nipples will not be permitted in any location in copper lines where connections are made to brass fixtures, valves or trim. Compression stops may be used when fitted tight against the wall escutcheon with no exposed copper piping. Sweat adapters and chrome plated cover tubes may be used when the cover tube extends the entire pipe from the elbow in the wall or chase to the flush valve and fits tight.

Piping that is not shown on the Drawings, which is obviously necessary for complete systems, shall be provided and shall be amply sized in accordance with applicable codes and standards.

All welding fittings shall be Tube Turn, Taylor Forge, B & W, Ladish Yoloy, or equal.

The Contractor may use a mechanically formed tee fitting as manufactured by T-Drill or equal. All joints created in this manner shall be installed and brazed in compliance with Plumbing Codes and the manufacturer’s recommendation. Soft soldered joints are not allowed in mechanically formed tee fitting installations. The branch tube shall be notched and contain a double dimple. The first to insure proper penetration into the main line. The second dimple (1/4" above the first) will serve as a visual inspection point.

Grooved pipe fittings, valves and couplings shall be Victaulic, Anvil Gruvlok, Central Sprink, Star or equal. All components shall be supplied by one manufacturer.

Underground steel piping systems shall be coated with asphaltum or bituminous paper for corrosion protection.

Plastic piping shall not be used in air plenums or in buildings classified as noncombustible construction.

The piping for the various systems shall be as follows:

Cold, hot and recirculating hot water in buildings above ground, 4 inches and smaller shall be Type L, hard drawn copper tubing, ASTM B88 and Federal Specification

WW-T-799. Fittings shall be wrought copper solder type, ANSI B16.22. Joints for pipe and fittings shall be made with No. 95-5 (tin-antimony) solder and No. 50 non-corrosive flux. Pro-Press, or equal copper pipe fitting system may be used.

Water piping outside of building, 4 inches and larger shall be ductile iron or DR18 plastic as follows:

Water outside of building, 4 inches and larger shall be ductile iron, bell and spigot. Four inch through six inch may be Class 52 and eight inch and larger shall be Class 50 water pipe with mechanical joint fittings meeting AWWA Standard C153. Pipe and fittings shall be coated with asphaltum and internally cement lined. Furnish and install thrust blocks and/or tie-rods in accordance with the local water department standards and regulations.

Water beyond 5 feet outside of buildings 4 inches and larger may be Class 150, AWWA C900 plastic pipe meeting the requirements of DR18 where codes permit. Pipe fittings shall be mechanical joint fittings meeting AWWA Standard C153. Furnish and install thrust blocks and/or tie-rods in accordance with the local water department standards and regulations.

Soil, waste, rainwater and vent piping in buildings underground shall be cast iron, ABS or PVC plastic.

Piping may be service weight cast iron soil pipe, Federal Specification WW-P-401 hub and spigot to 5 feet outside building walls, coated with asphaltum. Fittings shall be cast iron hub and spigot, coated with asphaltum. Piping may be hubless cast iron pipe and fittings.

Where codes permit, piping may be ABS or PVC Schedule 40 plastic piping and fittings. ABS piping and fittings shall meet ASTM D2661-68. PVC piping and fittings shall meet ASTM D2665-68 and Federal Specification L-P-320.

Soil, waste, rainwater and vent piping in building, above ground shall be galvanized steel, cast iron, ABS or PVC plastic as follows:

Piping may be galvanized steel pipe, ASTM A120, Federal Specification WW-P-406, Schedule 40, screwed. After assembly of pipe and fittings, paint visible threads with aluminum paint. Fittings shall be standard weight, black cast iron (galvanized cast iron where required by code), screwed. For waste, soil, and rainwater piping, drainage type (Durham) fittings of long pattern shall be used. For rainwater piping the Contractor may use grooved galvanized steel pipe, grooved fittings and mechanical couplings by written request to the Architect/Engineer including evidence that governing codes permit its use and naming the material manufacturer, pressure rating and other pertinent data.

Piping may be standard weight screwed, or hubless cast iron pipe and fittings. If screwed cast iron is used, threads shall be painted after assembly.

Where codes permit, piping may be ABS or PVC Schedule 40 plastic piping and fittings. ABS piping and fittings shall meet ASTM D2661-68. PVC piping and fittings shall meet ASTM D2665-68 and Federal Specification L-P-320.

For 2 inch and larger pipe, piping may be standard weight, cast iron, hub and spigot soil pipe, Federal Specification WW-P-401. For 1-1/2 inch and smaller pipe, Schedule 40, galvanized steel, ASTM A120 and Federal Specification WW-P-406. Fittings for hub and spigot shall be long pattern. For 1-1/2 inch and smaller fittings shall be black cast iron, screwed, drainage fittings (Durham) long pattern. Hub and spigot joints shall be preformed molded rubber rings where codes permit.

For sizes 1-1/2 inch and smaller, piping may be Schedule 40, galvanized Yoloy screwed pipe, ASTM A53 and Federal Specification WW-P-404.

Soil, waste, and rainwater piping outside of building shall be ABS or PVC plastic or cast iron pipe (CIP) as follows:

Cast iron pipe shall be service weight soil pipe Federal Specification WW-P-401, coated.

Where codes permit, piping may be ABS or PVC Schedule 40 plastic piping and fittings. ABS piping and fittings shall meet ASTM D2661-68. PVC piping and fittings shall meet ASTM D2665-68 and Federal Specification L-P-320.

Where codes permit, piping may be ABS or PVC type SDR 35 plastic piping and fittings. Piping and fittings shall meet ASTM 3033 and 3034.

Cooling coil condensate drains and louver drains in buildings above ground shall be PVC or Copper, as follows:

Schedule 40 PVC piping and fittings shall meet ASTM D2665-68 and Federal Specification L-P-320.

Type L, hard drawn copper tubing, ASTM B88 and Federal Specification WW-T-799. Fittings shall be wrought copper solder type, ANSI B16.22. Joints for pipe and fittings shall be made with No. 95-5 (tin-antimony) solder and No. 50 non-corrosive flux. Pro-Press, or equal copper pipe fitting system may be used.

Natural gas piping shall be standard weight black mild steel pipe, ASTM A120/ ASTM A53 and Federal Specification WW-P-406. Fittings for exposed gas piping up to and including 2 inch size shall be standard weight black malleable iron screwed fittings. Fittings 2-1/2 inch size and larger and in all concealed locations shall be welding type. There shall be no unions installed in concealed locations. Mega-Press, or equal pipe fitting system may be used. All underground gas piping shall be a gas polyethylene piping system designed, tested and certified for direct burial. Provide risers to transition from below ground polyethylene pipe to above ground metallic pipe. Provide detectable marking tape and tracer wire to locate the line after burial. A manual shut-off valve, union, and pressure regulator shall be installed at each item of mechanical equipment with a gas connection. A manual shut-off valve shall be installed at all gas connections.

Compressed air piping shall be standard weight black mild steel pipe, ASTM A120/ASTM A53 and Federal Specification WW-P-406. Fittings for exposed piping up to and including 2 inch size shall be standard weight black malleable iron screwed

fittings. Fittings 2-1/2 inch size and larger shall be welding type. A manual shut-off valve shall be installed at each connection.

1.27 VALVES:

Furnish and install valves in piping where so indicated on the Drawings. In addition, shut-off valves shall be provided in piping adjacent to each item of equipment, fixtures, etc., in the branch piping to each toilet group and at the base of all water risers.

All cold water and chilled water valves shall have an extended operator stem and insulation sleeve to accommodate the pipe insulation and vapor barrier.

All gate and globe valves shall be installed with stem in a vertical position wherever possible.

Of the several manufacturers listed, the Contractor is to standardize on one make as much as practical but not to the extent of sacrificing quality listed. Valves shall be Milwaukee, Crane, Powell, Stockham, Walworth, Victaulic, Grinnell, Anvil Gruvlok, Watts, Nibco, Hammond or equal.

The valves designated in the following schedule are fully described in the valve list following this schedule.

Valve Service	Valve Designation
Shut-Off Valves For:	
Cold, Hot and Recirculating Hot Water	
Pipe sizes 2 in. and smaller	V-l or V-2
Pipe sizes 2-1/2 in. and larger	V-13
Natural Gas	
Pipe sizes 2 in. and smaller	V-9
Pipe sizes 2-1/2 in. and larger	V-11
Balancing Valves For:	
Recirculating Domestic Hot Water	V-l
Check Valves For:	
Cold, Hot and Recirculating Hot Water	
Pipe sizes 2 in. and smaller	V-4
Pipe sizes 2-1/2 in. and larger	V-8
Drain Valves	V-14

The following is a list of valves types from which valves for use on this project have been selected. See the valve service schedule preceding this list for types to be used on each service.

(V-1) Ball Valves (Fed. Spec. WW-V-35b,): Bronze body ball valve, conventional port, lever handle, screwed or soldered and teflon seats and stem packing, 150 psi SWP, 400 psi WOG, Milwaukee BA-100 or BA-150, 1/2 inch through 2 inch size. Provide Memory Stop on all valves used for balancing purposes.

(V-2) Gate Valves (Fed. Spec. WW-V-54c, Class A. Type II): Bronze body gate valve, rising stem, solid bronze wedge, screw-in bonnet, threaded or soldered ends, teflon packing, 125 psi SWP, 200 psi WOG, 1/4 inch through 2 inch size, Milwaukee 148 or 149.

(V-4) Bronze Check Valve (Fed. Spec. WW-V-5ld, Class A, Type IV): Bronze check valve, horizontal swing regrinding type, Y-pattern, renewable disc, 125 psi SWP, 200 psi WOG, 1/4 inch through 2 inch size, Milwaukee 509 or 1509.

(V-8) Iron Body Check Valve: Iron body swing check valve, bolted bonnet, horizontal swing renewable seat and discs, flanged, bronze trim, 125 psi SWP, 200 psi WOG, 2-1/2 inch size and larger, Milwaukee F-2974.

(V-9) Plug Cock: Bronze body square head cock, screwed, 150 psi 1/8 inch through 2 inch size, Lunkenheimer 454.

(V-11) Lubricated Plug Valve: Semi-steel body lubricated plug valve, wrench operated, 100 percent area, rectangular port, screwed or flanged, teflon stem seal, natural gas service, 125 psi SWP, 150 psi WOG, Homestead 602.

(V-13) Butterfly Valve: Wafer or lug type iron body butterfly valve, extended neck, stainless steel shaft, bronze disc, EPT seal and seal with 275 degrees F. temperature rating, lever operated up through 6 inch valve size and gear and crank operator over 6 inch valve size, 150 psi WOG, 2-1/2 inch size and larger Milwaukee "M" series.

(V-14) Drain Valve: Bronze body globe valve, screw-in bonnet, integral seat, renewable discs, 1/8 inch through 2 inch size, Milwaukee 502 or 1502.

1.28 PIPING CONNECTIONS:

Furnish and install unions or mating flanges at all connections to each piece of equipment, conveniently located to facilitate quick and easy disconnecting of equipment for replacement, tube cleaning or general maintenance. Flanged or union connections shall be used on both sides of equipment connections, steam traps, control valves, pressure reducing valves, meters, tanks, pumps and the like. Unions or flanges shall be of the same material or finish as the piping systems in which they are installed. Unions are not required for grooved pipe systems.

Dielectric unions, flanges, or waterways shall be installed in hydronic piping systems, domestic hot, cold and recirculating water lines where copper or brass piping is connected to ferrous material such as steel piping, steel tanks, steel water heater, etc. Dielectric unions 2 inch size and smaller shall be steel body and nut with insulating gasket and copper connector, 250 psi rating at 190 degrees F., EBCO Model FX, FB, or EA. For 2-1/2 inch size and larger, the union shall be flanges, cast iron with insulated gasket and copper connector, 175 psi rating at 190 degrees F., EBCO Model GX or GA.

Grooved pipe and mechanical joint couplings may be utilized in certain piping systems with Architect/Engineer approval. See section on pipe and pipe fittings.

1.29 FLEXIBLE CONNECTORS:

Furnish and install flexible connectors on all piping connections to rotating equipment such as pumps, compressors, chillers, condensing units, fluid coolers etc., and where shown on the Drawings. Flexible connectors shall also be installed at all locations where necessary to prevent damaging stresses to piping, equipment, or building structure, and where necessary to isolate noise at its source.

Flexible connectors for pumps, etc., shall be Kinetics noise control type FTC, or equal double sphere molded neoprene, reinforced with nylon tire cord and shall have mild steel floating flanges or threaded ends. The connectors shall be rated for 150 psig at 220 degrees F. Control rods shall be used on 12 inch and larger sizes operating above 100 psig. Flexible connectors may be close pitch annular corrugated stainless steel metal hose, Type 321 stainless steel for all ferrous piping systems, Kinetics BFMC, or equal.

Flexible connectors for all air compressors shall be close pitch annular corrugated stainless steel metal hose, Type 321 stainless steel for all ferrous piping systems, Kinetics BFMC, or equal.

Flexible connectors shall be installed in strict accordance with manufacturer's recommendations and shall be constructed of material specified herein, unless recommended otherwise by the manufacturer for specific applications. All piping shall be anchored to prevent elongation or compression of the flexible connectors.

Flexible connectors for installation outdoors (at chillers, fluid coolers, etc.) shall be rated for -25 deg. F or colder operating temperature.

Flexible Connectors shall be Kinetics, Metraflex, Proco, Mercer, Flexonics, Twin City Hose, Inc., Maxon Industries, or equal.

1.30 PIPE ALIGNMENT GUIDES:

Furnish and install pipe guides at expansion loops, expansion joints, and elsewhere shown on the Drawings. They shall consist of a heavy 4 inch pronged clamp, bolted to the pipe and sliding inside a bolted steel sleeve which is attached rigidly to the structure of the building by means of sturdy extension bracing.

Guides shall be of sufficient length to maintain at least 25 percent engagement (overlap) for maximum travel of the piping.

Manufactured guides shall be Keflex, Mave Type PM, Flexonics, Elcen Figure 511, or equal.

1.31 EXPANSION COMPENSATORS AND GUIDES:

Furnish and install Metra-Flex model HP or equal expansion compensators where shown on the Drawings and where required to allow for free expansion of piping. All expansion compensators, guides and anchors shall be installed in strict accordance with manufacturer's recommendations.

Expansion compensators shall be constructed of all metal with stainless steel bellows, carbon steel housings and fittings and be suitable for 150 psi operating pressure and 850 degrees F. operating temperature. Compensators shall be designed for 1.5 inches of expansion per 100 feet of piping.

Expansion Compensators and guides shall be MetraFlex, Flexonics or equal.

1.32 PIPE HANGERS, SUPPORTS AND ANCHORS:

Anchors as shown and detailed on the Drawings and specified herein and/or as required. All support components shall conform to Manufacturer's Standardization Society Specification SP-58. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustment to maintain pitch required for proper drainage. They shall allow for expansion and contraction of the piping. On other than vapor barrier insulated lines, hangers shall bear directly on piping.

Hangers shall be constructed of malleable or wrought iron unless noted otherwise, and hangers supporting copper pipe shall be copper plated. Hangers for pipe 3 inches and smaller shall be band and socket Michigan Model No. 100 or equal. For piping over 3 inches, hangers shall be adjustable, Clevis type, Michigan Model No. 400 or equal.

Where groups of three or more pipes occur, they may be supported with trapeze hangers using two hangers as specified with a capped pipe cross member.

Where clearance between pipe and overhead support is insufficient for the use of other hangers specified, use Michigan Model No. 605 or equal.

Provide piping Supports, guides, and allow for expansion for horizontal and vertical piping according to Uniform Plumbing Code (UPC) section 313.0 “Hangers and Supports” minimum requirements, the pipe manufacturer’s installation instructions, and the Authority Having Jurisdiction, whichever is more stringent.

Pipe hangers shall not be attached to the roof deck. Hangers shall be attached to the structure with beam clamps, beam attachment and brackets bolted to joists and beams. Use Michigan Model No. 340 or equal, steel washer plates for pipe supported from steel joist. The Contractor shall endeavor to hang near joist panel joints wherever possible.

Pipe hangers for cold piping, horizontal downspout piping and all insulated piping on trapeze hangers shall be large enough to encompass the insulation, using a metal shield so the vapor barrier jacket will not be broken. See Insulation Section.

Pipe mounting brackets for cold piping shall be large enough to encompass the insulation B-Line Model B2417 or equal. This piping shall be anchored securely at the point of connection to plumbing fixtures. The last mounting bracket adjacent to fixtures and equipment may clamp directly onto the pipe. A short length (18 inches maximum) of piping between the last bracket and the connection is allowed without insulation.

Hanging from one pipe to another is prohibited.

Pipe anchors shall consist of heavy steel collars with lugs and bolts for clamping and attaching anchor braces, unless otherwise shown on the Drawings. Anchor braces shall be installed in the

most effective manner to secure the desired results, using turnbuckles where required. No supports, anchors, and stays shall be attached in places where they will injure the construction either in installation or by the weight or expansion of the pipe line.

Pipe Hangers shall be Michigan, Grinnell, PHD, B-Line or equal.

1.33 PIPING INSTALLATION:

All pipes shall be round and straight, of required size. Cutting shall be done with proper tools and pipes shall be reamed to full size after cutting.

Piping shall be properly enclosed, supported, guided, anchored, sway braced, connected, tested, cleaned and flushed out and shall be properly insulated and protected where required.

All pipes shall be run with proper grade to provide for easy draining and in group runs where applicable and in a neat and orderly manner, to the satisfaction of the Architect/Engineer. Lines required to be enclosed in ceiling, chaseways or similar spaces shall be installed to permit such enclosure as intended. All pipe runs shall be carefully laid out and scheduled to avoid necessary interferences with other work. Pipe sizes shown on the Drawings are nominal pipe sizes and not outside diameters.

Pipes shall be run substantially as indicated on the Drawings. However, the Architect/Engineer reserves the right to require this Contractor to make changes in pipe locations where conflicts occur with other trades. Such changes shall be made without extra cost to the Owner.

Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Such provision shall be made by means of piping offsets, changes in direction, expansion loops and/or suitable expansion joints. Suitable anchors and guides shall be provided to permit proper deflection and compression of offset loops and expansion joints. Expansion joints shall not be used in lieu of offsets, changes in direction or loops, except where specified and/or indicated on the Drawings or where otherwise obviously necessary.

Exposed piping shall be installed in a sanitary manner for ease in cleaning. Pipe shall be cut and threaded to fit the installation. Wherever possible, rough-in exposed pipe connections at the wall rather than the floor for ease in cleaning.

Equipment piping shall also include wastes and drains which are safe-wasted without a direct connection.

Minimum grade for horizontal drainage piping shall be 1/4 inch per foot for 3 inch diameter piping or less, 1/8 inch per foot for 4 inch and 6 inch diameter piping and 1/16 inch per foot for drainage piping over 6 inch diameter.

1.34 PRESSURE GAUGES:

Furnish and install U.S. Gauge Model 5105 or equal pressure gauges in pipelines and on equipment as indicated herein and/or where shown on the Drawings. Gauges shall have phosphor bronze bourdon tube with brass movement.

Gauges shall be compound, pressure or vacuum as required with 4-1/2 inch diameter dial. Each gauge shall be complete with Trerice No. 872 pressure snubbers, and brass ball valves.

The normal operating pressure of each gauge shall be 50-70 percent of full scale. The range of the scale shall be suitable for the application.

The gauges shall be located and mounted such that they can be conveniently read by a person standing on the equipment room floor. Accuracy shall be Grade "A". Case shall be aluminum.

Pressure gauges shall be U.S. Gauge, Trerice, Weksler, Ashcroft, Weiss or equal.

1.35 THERMOMETERS:

Furnish and install Weiss "Thriftline" TL5S2 or TS5A2 or equal thermometers in pipelines and equipment as tabulated and/or where shown on the Drawings. Thermometers shall have a minimum of 6 inch scale with separable socket, cast aluminum case, red reading mercury, industrial type complete with thermometer wells.

The normal operating temperature of each thermometer shall be at 50-70 percent of full scale. The range of the scale shall be suitable for the application.

Thermometer installation will not be accepted unless they can be easily read by an operator standing on the floor.

Thermometers shall be provided at the inlet and outlet of each and all chillers, boilers, heat exchangers, storage tanks, and cooling tower supply and return piping. Thermometers shall also be required on the outlet of all domestic water heaters and mixing valves.

Thermometers shall be Weiss, Trerice, Weksler or equal.

1.36 PRESSURE/TEMPERATURE TEST PORTS:

Furnish and install where indicated on the Drawings or tabulated below pressure/temperature test ports. Port shall be solid brass with valve cores capable of receiving either temperature or pressure probe with 1/8 inch o.d. Cores shall be Neoprene when application maximum temperature is 200 degrees F. or less and 500 psi, or Nordel for temperature up to a maximum of 275 degrees F. at 500 psi.

Pressure/temperature test ports shall be installed at each and all heat/cooling coil inlets and outlets. On coils with 3-way control valves an additional port shall be required between the control valve discharge and the balance valve or flow meter.

Provide test ports at the inlet and outlet of each and all pumps, hot water generators, storage tanks, supply and return piping unless permanently mounted pressure and temperature measuring devices are indicated elsewhere in the specifications or shown on the Drawings.

Test Plugs shall be Sisco, Pete's or equal.

END OF SECTION 220100

SECTION 220400 – PLUMBING

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

Section 220100, General Provisions, in its entirety, including references to the General Construction Specifications, are hereby adopted and made part of these Specifications.

The work involved in this specification and the accompanying Drawings consists of performing all labor and furnishing of all materials, fixtures and equipment necessary to install complete sanitary sewer systems and potable hot and cold water systems, as described herein and/or shown on the Drawings. This includes all piping, wiring and materials obviously necessary for complete systems though not specifically mentioned or shown.

See Section 220700 for insulation requirements.

1.02 SYSTEM OF PLUMBING:

The continuous waste and vent method of plumbing shall be installed. Hot, tempered and cold water lines are to be installed where shown. All water piping in finished areas shall be concealed in joist spaces above ceilings, and in walls.

Pipes run overhead shall be placed as close to the ceiling as possible, to maintain proper headroom and to present a neat appearance, all consistent with the pitching of pipes for drainage of the systems.

The plumbing work shall be installed in strict accordance with the best plumbing practice, all subject to the Architect/Engineer's approval in accordance with all applicable local, state and national plumbing regulations.

1.03 PLUMBING VENT THRU ROOF (VTR):

Vent stacks from sewer, soil, waste and drain pipes shall be extended at least 12 inches above the roof. The top of the vent shall be designed so as to permit the insertion therein of a testing plug of such form that it can be readily seen until removed, and said plug shall be removed at once after final inspection has been made and approved by the Architect/Engineer. The minimum size of any vent passing through roof shall be 4 inches.

Vents at all sloped roofs shall be black in color above the roof line.

1.04 CLEANOUTS:

Full size brass screw cleanout plugs shall be furnished and installed at the bottom of all soil and waste stacks and at all points where shown on the Drawings and where necessary to permit the entire drainage system to be rodded out easily. Floor drains located in branch lines shall have cleanouts adjacent to the drains.

Floor cleanouts shall be cast iron with inside caulk ferrule, brass plug, adjustable housing and round nickel brass secured frame and scoriated cover. Wade covers shall be heavy duty. In ceramic and quarry tile floor finishes the cover shall be square. The cover shall be provided to accept the floor covering in the location being installed, i.e., synthetic covering, composition tile, terrazzo, etc., Zurn Z-1425, Wade W-6010; Josam 58100; or equal. Flashing clamp and collar shall be furnished with all cleanouts installed in floors having waterproof membranes. Wall and ceiling plates shall be Zurn Z-1469, Wade W-8480-R, Josam 58600, or equal.

Cleanouts shall be Wade, Zurn, Josam, Ancon, J. R. Smith, Mifab, Sioux Chief, Watts, or equal.

1.05 FLOOR DRAINS:

Furnish and install floor drains where shown on the Drawings and as specified or equal. All floor drains installed in floors with waterproof membranes shall have flashing clamps.

Floor drains except in mechanical rooms, garages and the like shall be Josam Series 30000-A, Wade W-1100 or equal with 5 inch diameter Nickaloy strainer having a minimum of 7.3 square inch free area. In ceramic and quarry tile floor finishes the floor drain strainer shall be square. Furnish and install a deep seal trap.

Floor drains in mechanical rooms shall be Josam Series 30000-E, Wade W-1100-TS or equal with heavy duty 8 inch diameter grate. Furnish and install a deep seal trap with cleanout.

Floor drains shall be Josam, Zurn, Wade, Smith, Ancon, Mifab, Sioux Chief, Watts, or equal.

1.06 FLOOR SINKS:

Furnish and install Josam Series 49320A-NB or equal Floor Sinks where shown on the Drawings. Floor sinks shall be square cast iron sanitary floor sinks with acid resisting interior, double drainage flange, integral aluminum dome strainer, nikaloy sanitary sloped rim and anti-tilting grate. Floor sinks shall be 6-1/4 inches deep with 10 inches square full grates.

Floor Sinks shall be Josam, Zurn, Wade, Smith, Ancon, Mifab, Sioux Chief, Watts, or equal.

1.07 ROOF DRAINS AND DOWNSPOUT NOZZLES:

Furnish and install Wade W-3000, Josam Series 21500 cast iron roof drains or equal where shown on the Drawings. The roof drains shall be complete with flange, flashing ring with integral gravel stop, non-corrosive clamping units, locking type metal dome strainers, and extensions as required by insulation thickness.

Overflow roof drains shall be Wade W-3000-SD Josam 26010 cast iron roof drains or equal where shown on the Drawings. The drains shall be complete with flange, flashing ring with integral gravel stop, non-corrosive damping units, locking type dome strainers, and extensions to match the roof insulation thickness. The standpipe height shall be 2 inches above the adjacent roof drain or roof line, whichever is of higher elevation.

Furnish and install a 36 inch x 36 inch lead flashing, 3 pound density, for each roof drain installed in a built up roof.

Furnish and install Wade W-3940, Josam Series 25010, Rectorseal GON cast brass downspout nozzles or equal with threaded or glue on outlet and flange at each downspout discharge as shown on the Drawings. Unless noted otherwise, the downspout nozzle shall be located 18 inches above grade. The nozzle flange shall be anchored to the wall with brass screws.

Roof drains and downspout nozzles shall be Wade, Josam, Zurn, Smith, Ancon, Mifab, Sioux Chief, Watts, or equal.

1.08 WASTE, VENT AND WATER CONNECTIONS TO FIXTURES:

Rough-in for waste, vent and water connections at the various fixtures shall be as follows, unless noted otherwise:

	Waste	Vent	Water
Water closet (tank)	4"	2"	1/2"
Water closet (flush)	4"	2"	1-1/4"
Urinal	2"	1-1/2"	1"
Lavatory	1-1/2"	1-1/2"	1/2"
Sink	2"	1-1/2"	1/2"
Kitchen sink	2"	1-1/2"	1/2"
Service sink and receptor	3"	1-1/2"	1/2"
Drinking fountain and EWC	1-1/4"	1-1/4"	1/2"

Waste, vent and water supply piping to plumbing fixtures and equipment which is not shown on the Drawings shall be provided and shall be amply sized in accordance with the above schedule. All plumbing fixtures, wastes, and drains shall be vented in accordance with all applicable Local, State and National Plumbing Regulations.

1.09 PLUMBING FIXTURES:

Furnish and install all plumbing fixtures as specified hereinafter and as designated on the Drawings. Catalog numbers shown are used to designate the type of fixture desired. Special equipment included in this schedule is identified by brand name and number.

Caulk around all floor and wall mounted fixtures. Caulking shall be done in a skilled manner with silicone based white acrylic latex caulk. Caulking shall be water tight, flexible, mildew and shrink resistant.

All exposed flush, waste and supply pipes at the fixtures shall be chromium-plated brass pipe, iron pipe size. No steel nipples or cover tubes will be allowed. The stop valves, pop-up wastes,

flush valves, etc., shall be heavy cast brass chromium-plated. Waterlines to all the individual fixtures, where exposed, shall be equipped with high grade, loose key chromium plated brass stop valves unless scheduled otherwise on the Drawings. All chromium plating shall be applied over a nickel plated base. Enameled fixtures shall be acid resistant. Provide backing in the wall to support the fixture. All water closets shall have bolt caps with retainer clips. Groups of fixtures shall be matched.

The Schedule shown on the Drawings is given for the convenience of the Contractor who is to be responsible for exact quantities. Any fixtures indicated on the Drawings, but not specifically mentioned in the Specifications or scheduled, shall be furnished by the Contractor.

Plumbing Fixtures shall be as scheduled, American Standard, Crane, Briggs, Kohler, Sloan, Vitra, Zurn-One, Gerber, or equal.

Fixture carriers shall be Josam, Wade, Zurn, Blake, Smith, Watts or equal.

Brassware shall be the manufacturer's own brass, Chicago Faucet, T&S Brass, Speakman, Cambridge Brass, Zurn, Gerber, American Standard, as scheduled or equal. Faucets shall meet NSF Standard 61, Section 9 for drinking water.

Lavatory faucets shall have a five year minimum warranty against leaking and shall be equipped with temperature limit stops and vandal resistant aerators. Faucet bodies shall be chrome-plated zinc die-cast or solid cast brass (polished or chrome plated) as scheduled on the Drawings. Lavatory faucets shall be American Standard, Delta, Moen, Zurn, Chicago/Geberit, Kohler, Sloan, Bradley, Speakman, T&S Brass, Cambridge Brass, Gerber, or equal.

Fiberglass shower enclosures shall be Warm Rain, Aqua Glass, Lasco, Kohler, Aquarius or equal.

Mop sinks shall be Fiat, Stern Williams, Swan, Mustee, Zurn as scheduled or equal.

Stainless Steel sinks shall be Elkay, Carlton, Just, as scheduled or equal.

Water Closet seats shall be as scheduled, Centoco, Church, Bemis, Beneke, Sperzel, Olsonite, Gerber, or equal.

Flush Valves shall be as scheduled, American Standard, Sloan , Zurn or equal.

1.10 CIRCULATING PUMPS:

Furnish and install Bell and Gossett Model PL or equal in-line circulating pumps on the hot water circulating piping where shown on the Drawings.

Pumps shall be horizontal, permanently lubricated type, specifically designed and guaranteed for quiet operation and suitable for 150 psi working pressure.

The pumps shall have a steel shaft supported by permanently lubricated, sealed precision ball bearings. The pumps are to be equipped with a water-tight seal to prevent leakage. Mechanical seal faces shall be carbon on silicon carbide. The motor shall be non-overloading at any point on the pump performance curve.

The pump shall be of all bronze construction suitable for domestic water use.

The motor shall be of the drip-proof, sealed precision ball-bearing, quiet-operating construction. The permanent split-capacitor motor shall be equipped with thermal overload protection.

Pumps to be suitable for 225 degrees F (107 degrees C) operating temperature at 150 psig (10 bar) working pressure.

The pump shall be directly driven, 115 volt, 60 cycle, 1 phase motor.

Capacities shall be as scheduled on the Drawings.

Circulating Pumps shall be Bell & Gossett, Taco, Armstrong, Amtrol or equal.

1.11 SHOCK ABSORBERS:

Piping shall be installed with proper safeguards to prevent water hammer. This will be done by installing a sufficient number of shock absorbers where indicated on the Drawings.

The commercial shock absorbers indicated on the Drawings shall be sized as follows:

Size	Fixture Units
SA-1	1 -11
SA-2	12-32
SA-3	33-60
SA-4	61-113
SA-5	114-154
SA-6	155-330

Shock Absorbers shall be Josam, Wade, Zurn, Sioux Chief or equal.

1.12 WALL HYDRANTS:

Furnish and install 3/4 inch freezeless type wall hydrants where shown on the Drawings. Wall hydrants shall be Woodford Model 65 or equal, modular brass body with brushed chrome finish and self-draining vacuum breaker. Operating stem shall be hardened stainless steel with loose-key operator. Provide a key with each hydrant and unless stated otherwise, the hydrant shall be installed 24 inches above finished grade. The Contractor shall verify the required operating rod assembly length based on wall thickness.

Wall hydrants shall be Woodford, Zurn, Smith, Watts or equal.

1.13 HOSE BIBBS:

Furnish and install Woodford Model No. 24P-3/4 or Model 24C or equal hose bibb where shown on the Drawings. Hose bibbs shall be female type with 3/4 inch thread inlet, 3/4 inch hose thread

outlet, with integral vacuum breaker, and rough brass finish. Unless noted otherwise, the hose bibbs shall be installed 42 inches above finished floor.

Hose Bibbs shall be Nibco, Watts, Woodford, Zurn or equal.

1.14 GAS WATER HEATER:

Furnish and install a Phoenix Water Heater as manufactured by Heat Transfer Products, Inc. with identification of model number PH 199-119. The water heater shall be a sealed combustion system, taking only outside air for combustion and exhausting the flue gas with PVC Schedule 40 or 80 PVC, or CPVC solid core pipe. The heater as well as all related intake air and exhaust intake air and exhaust gas piping shall be approved for zero clearance to any combustible surface. The units total combined equivalent venting length, including fitting allowances for both the intake air and exhaust gas shall not exceed 85' (in the units native size as manufactured and stated on the unit model product data sheet) in 2", or 3" pipe or 125' for the next size up of 3" or 4" from the heaters location.

The heaters tank shall be constructed of 316L stainless steel. The primary condensing heat exchanger shall be constructed of 90/10 cupronickel. The secondary heat exchanger shall be constructed of 800H stainless steel and 90/10 cupronickel. The tank insulation shall be water blown foam 2" thick in the side wall with a rating of R14.2 and 3" thick in the top with a rating of R21.3. Insulation shall be enclosed in a plastic jacket on the sides as well as the top and bottom. All components shall be located on the front of the heater for easy access and serviceability. All related hardware shall be constructed of stainless steel studs with brass nuts for serviceability. All water connection nipples shall be constructed of stainless steel and be attached to the side of the tank. The top and bottom of the tank shall be smooth with no pipe tappings on the top or legs on the bottom.

The heaters shall be UL/ULC listed and will exceed the minimum efficiency requirements of ASHRAE 90.1b -1992. All heaters shall be approved in accordance with ANSI Z 21.10.3. All heaters will be supplied with a factory installed ASME rated temperature and pressure relief valve. All heaters shall be supplied with a factory installed low water cutoff, and upper hot water sensor, and lower cold water sensor. All heaters shall be furnished with a factory installed condensate trap assembly ready for easy connection to a field supplied condensate drain.

The heater shall have an integrated digital controller device with integral diagnostics, LED fault and temperature settings for establishing set point, temperature differential. Ignition shall be with direct spark with ignition taking place at a pre-set ignition speed for the burner blower. The control shall utilize an algorithm to fully adjust the burner modulating firing rate while maintaining the desired temperature. The pre-mix stainless steel burner uses a 120 volt motor with pulse wave modulation control to change the fan speed, thus the combustion air volume of fuel and air through the burner to establish an infinite BTU input range equal to the water heating set point requirement. The digital LED control display shall provide means, via push buttons, for adjustments of operating temperatures, differential adjustment, ECO reset, service mode, and real time status mode. In addition there shall be provided a computer connection via laptop computer for perpetual history including all fault codes, and hours of operation above 50% of input, below 50% of input as well as real time status reporting of all operations. The burner assembly shall be mounted so as to be easily removed as an integral unit for easy serviceability.

The heater shall be in compliance with the NOx Emissions limit as set forth in SCAQMD Rule

1146.2 – 1998.

The heater shall be factory assembled; test fired for correct BTU input and adjusted for proper combustion parameters. Complete operating and installation instructions shall be furnished with every heater as packaged by the manufacturer with the heater for shipping.

Water heaters shall be Phoenix or equal.

1.15 WATER SERVICE MAIN:

Furnish and install a water service as shown on the Drawings. The water meter shall be purchased from the City or shall be of the type approved by the City. All outside water piping shall be installed at a minimum depth of 6'-0" below finished grade.

All underground piping for fire mains shall be installed, clamped, anchored, flushed and hydrostatically pressure tested according to the requirements of the authorities and agencies having jurisdiction and NFPA Pamphlets No. 13 and 24.

The Contractor shall furnish and install all concrete thrust blocks required for anchoring of the underground fire main. Thrust blocks shall be capable of restraining piping at test pressure of 200 psig.

1.16 SANITARY SEWER SERVICE:

Furnish and install sanitary sewer service as shown on the Drawings. The service within 5'-0" of the building and as designated on the Drawings shall be cast iron or PVC pipe and fittings. The service shall be extended at a uniform grade. The Contractor shall verify all invert elevations before beginning excavations.

The complete installation shall be in accordance with all applicable, Local, State, and National plumbing regulations.

1.17 GAS SERVICE:

Outside gas service to the meter location shown on the Drawings along with the gas meter and pressure regulator, will be installed by the Local Gas Company. Any costs for installation and/or relocation of outside gas service, shall be paid by the Contractor, and this cost shall be included in the Contractor's Base Bid.

1.18 MIXING VALVE (POINT OF USE TYPE):

Furnish and install an ASSE Thermostatic Mixing Valve on the hot water supply of all hand-washing sinks or lavatories. The Contractor shall confirm which sinks require 1070 valves, but typically restroom lavatories, kitchen hand-wash sinks, exam room hand-wash sinks do, while kitchen, breakroom, laundry, service type sinks do not.

The valve shall be ASSE Standard 1070 and IAPMO cUPC listed and control the temperature of the hot water. It shall have a Lead Free* brass body. Valve may be an “H” or “T” pattern. Install valve and tubing/hoses in a uniform manner below the fixture. Thermostatic valves shall comply with state codes and standards, where applicable, requiring reduced lead content. The valve shall

include integral check valves, integral screens and an adjustment nut with locking feature. The valve shall be provided with 3⁄8" (10mm) male compression fittings. Adjustable temperature range shall be approximately 80 deg. F. to 120 deg. F.

Valves shall be MCC Powers, Lawler, Symmons, Leonard, Watts Regulator, Powers Controls, Proflow, or equal.

1.19 REDUCED PRESSURE BACKFLOW PREVENTER:

Furnish and install Watts Regulator Co. Series No. 009-S, 909-S or equal reduced pressure backflow preventer. Where shown, the backflow preventer shall be a complete assembly including tight-closing shut-off valves before and after the device and also be protected by a strainer. The design shall include test cocks and a pressure-differential relief valve located between two positive seating check valves.

The device shall meet the requirements of A.S.S.E. Standard 1013 and A.W.W.A. Standard C506. Unit vent outlet shall have a suitable connection for an air gap and shall be provided with an air gap fitting piped to a floor drain.

After installation the backflow preventer shall be tested and certified by a licensed technician.

Reduced pressure backflow preventers shall be Watts, Hersey, Conbraco, Febco, Wilkins or equal.

1.20 ELECTRIC WATER COOLERS (TWO LEVEL):

Furnish and install a two level electric water coolers where shown on the Drawings. Units shall have light touch push bars, bubblers, pressure regulator, hermetic compressor, stainless steel tops and receptors, stainless steel cabinet faceplate. Units shall be air cooled with fractional horsepower, 115 volt, single phase motor including integral thermal overload protection and 3-wire grounded plug. Entire unit shall be guaranteed for 5 years.

The electric water cooler shall be ADA compliant and shall be lead free.

Furnish the cooler with a cane apron under the upper unit when the cooler is not installed in a recessed area.

Handicapped units shall be mounted with the outlet orifice at 36" maximum and standard units shall be mounted with the outlet orifice at 42" above finished floor unless noted otherwise on the Drawings.

Water cooler capacity shall be 7.6 gph of 50 degrees F. water with an 80 degrees F. inlet water temperature and 90 degrees F. ambient room temperature.

Water Coolers shall be Elkay, Oasis, Halsey-Taylor, Sunroc, General Electric, Haws or equal.

1.21 THERMAL EXPANSION ABSORBER:

Furnish and install a Thermal Expansion Absorber where shown and scheduled on the Drawings.

The steel tank shall have a flexible bladder separating air and water. The tank shall have a pressure rating of 150. Tanks installed for water heaters with 200,000 btuh input and greater shall conform to Section VIII of the ASME Unfired Pressure Vessel Code Standards.

Thermal Expansion Absorber shall be Amtrol, Armstrong, Taco, Elbi or equal.

1.22 GREASE INTERCEPTOR:

Furnish and install a Schier GB-75 Grease Interceptor as shown in the Drawings. Schier Great Basin™ grease interceptor model # GB-75 shall be lifetime guaranteed and made in USA of seamless, rotationally molded polyethylene. Interceptor shall be furnished for above or below grade installation. Interceptor shall be certified to ASME A112.14.3 (Type D) and CSA B481.1, with adjustable cover adapter, Safety Star® access restrictor built into cover adapter, and three outlet options. Interceptor flow rate shall be 75 GPM. Interceptor grease capacity shall be 861 lbs. Cover shall provide water/gas-tight seal and have minimum 16,000 lbs. load capacity. Interceptor shall be furnished with field cut riser model # FCR2 to enable access for below grade installation.

1.23 SUBMERSIBLE SUMP PUMP:

Furnish and install a Zoeller Model 152, or equal submersible sump pump where shown on the Drawings. Pumps shall be furnished complete with submersible motor and pump assembly, automatic float switches, alarm, across-the-line-starter, disconnect switch, sump basin and cover.

Each pmp shall be rated for capacity as listed in the schedule on the Drawings. Motor shall have Class "F" insulation rated for continuous duty.

The motor frame, end bell and pump volute shall be high strength cast iron.

Impeller shall be bronze or high strength cast iron, multiple blade open type designed for screened liquids.
Seals shall be mechanical, oil lubricated, double type mounted on stainless steel shaft to prevent liquid from entering the motor.

Bearings shall be permanently lubricated, extra heavy duty, ball bearing type.

Control panel shall be Weil series 8230 or equal complete with:

1. Fused disconnect switch with lock-out handle through the cover.

2. Magnetic starters with overload and low voltage protection.

3. Indicator lights with test button.

4. High level alarm bell mounted on panel door with silencing switch.

5. Overload reset button.

6. Control transformer.

7. Moisture sensor relay.

8. Temperature limiter relay.

9. Indicating light reset button.

Furnish and install mercury float switches complete with galvanized rod and wall support bracket. Each pump control switch will consist of 2 normally open mercury switches, encapsulated in epoxy resin. The float casing shall be polypropylene. The switch cable shall be type STO PVC jacket 4#18 conductor, 41 strand, 600 volt insulation. The cable shall be secured to the support rod with a polypropylene composition clamp with stainless steel bolts. Switches used for high water alarm service shall be of the same construction as the pump switches, except that 2 conductor cables shall be furnished. The switch housing shall be color coded to distinguish between the pump and alarm switches.

Furnish and install a sump basin constructed of high strength polyester reinforced glass fibers. Wall thickness will be no less than 3/16", 1/2" at flange and 3/8" at hub. Basin shall have hub inlets suitable to accommodate pipe sizes shown on the Drawings. Tapped bronze holes will be provided to accommodate the steel cover plate.

Sump pumps shall be Hydromatic, Liberty, Weil, Zoeller or equal.

1.24 TESTS:

The following tests shall be performed on the respective systems. Tests shall be repeated until each system is proven acceptable.

The Contractor is responsible for the following tests:

Soil, waste, and vent piping and rain water conductors, etc., shall be tested in accordance with applicable state and local codes. Unless stated otherwise in the applicable codes, these systems shall be tested with 5 psi air pressure for a period of 15 minutes with a maximum drop of 1 psi during this period.

Cold, hot and recirculating hot water shall be tested and proven watertight under a hydrostatic pressure of 100 psi.

END OF SECTION 220400

SECTION 220700 – PLUMBING AND HEATING INSULATION AND PIPING IDENTIFICATION

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

Section 220100, General Provisions, in its entirety, including references to the General Construction Specifications are hereby adopted and made part of these specifications.

The work involved in this specification and the accompanying Drawings consists of performing all labor and furnishing of all labor, materials, fixtures, and equipment necessary to install complete piping, and equipment insulation as described herein and/or as shown on the Drawings. This includes all equipment and materials obviously necessary for complete systems though not specifically mentioned or shown.

1.02 MATERIALS AND WORKMANSHIP:

All covering and insulating materials used on this project must contain the manufacturer's name on the containers. All materials must be dry and in good condition, free of defects, mildew, rough ends, etc. Insulation materials shall be Certainteed, Owens-Corning, Johns Manville, Armstrong, Knauf or equal.

All insulation work shall be performed by an Insulation Contractor who uses workers skilled in this type of work. Only first class workmanship will be acceptable. The Insulation Contractor shall submit shop drawings for all materials proposed to be installed in this project.

All pipe covering shall have a density of not less than 3-1/2 pounds per cubic foot.

All materials shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255, AND U.L. 723 not to exceed 25 Flame Spread and 50 Smoke Developed.

1.03 PIPING AND VESSELS INSULATION:

All pipe covering shall be furnished with a factory-applied all service jacket. All-Service jacket shall have a polymer film exterior surface. All longitudinal joints shall be sealed with adhesive such as Benjamin Foster 30-35, or equal, or factory applied self-sealing laps. All end joints shall be sealed with 3 inches wide butt strips of material identical to pipe covering jackets, using adhesive or self-sealing jacket. No stapling will be permitted on any vapor-barrier jackets. No vapor-barrier work or self-sealing laps or lap work shall be installed when temperatures are below 40 degrees F.

Cover with 30 mil PVC cover in all exposed areas except mechanical rooms. PVC cover shall have solvent welded joints and seams. Piping 10 ft or greater above the floor need not have PVC covering except in the designated wash bay area (plan northwest corner of garage).

Insulation shall be continuous through properly sized wall and floor sleeves with no joints within 12 inches of the penetration. Where a fitting is adjacent to the wall a continuous section of insulation must extend from the fitting to 12 inches beyond the other side of the wall.

Wrap pipe at penetrations of fire or smoke barriers with firestop pipe insulation, seal jacket seam and seal end joints to adjacent sections of insulation. Seal opening between insulation and pipe sleeve with firestopping material.

All plastic, fiberglass or other piping and fittings that are not rated for unprotected installation in return air plenums shall be wrapped with 3M Fire Barrier Plenum Wrap 5A+, or equal. The installation shall be in strict accordance with the manufacturer's written instructions. Wrap shall be a high temperature fiber blanket thermal insulation encapsulated in a fiberglass reinforced aluminum foil. Plenum wrap density shall be nominal 6 pcf and have a nominal ½ inch minimum thickness. The fiberglass blanket shall have a continuous use limit in excess of 1832 degrees F (1000 degrees C). Flame Spread Index and Smoke Developed Index of the foil encapsulated blanket shall be equal to or less than 25/50.

Alternatively, Johns Manville Micro-Lok HP, or equal fiberglass insulation which is UL listed and labeled to meet plenum flame and smoke spread ratings when installed over such plastic piping may be used to provide plenum protection. The installation and application shall be in strict accordance with the manufacturer's written instructions.

All piping exposed to outdoor weather conditions shall be additionally covered with 30 mil PVC jacket sealed watertight. PVC cover shall have solvent welded joints and seams.

All insulation installations shall conform to ASHRAE Standard 90.

1.04 FITTING AND EQUIPMENT INSULATION:

Insulate all fittings, valves, flanges and strainers with mitered segments of pipe insulation wired in place and premolded PVC plastic covers. Plastic covers shall be taped and sealed with a continuous vapor barrier on all cold systems. Plastic covers shall be Zeston or equal.

The Contractor shall allow for the removal and replacement of four (4) fitting or joint covers selected by the Architect/Engineer for inspection purposes. If any of the removed covers reveal unsatisfactory installation as determined by the Architect/Engineer, four (4) additional covers may be removed and replaced. Fitting covers may be removed and replaced four (4) at a time until the system installation is satisfactory.

For fittings where premolded PVC plastic covers are not available, coat each fitting with two 1/8 inch coats of an approved vapor-barrier mastic such as Childers CP-30 or equal. Reinforce each fitting by wrapping with glass fabric cloth extending 2 inches onto adjacent pipes and finish with additional coating of mastic worked into mesh of cloth to provide a smooth finish.

Coat vapor barrier penetrations, including insulation end butts, piping brackets, valve operator stems, etc., with two 1/8 inch coats of an approved vapor-barrier mastic. Trim the insulation at valve handle operators to allow for valve operation without damaging the vapor barrier. Insulation mastic for cold systems shall be Childer's CP-30 or equal for cold system vapor barriers. Vapor barrier shall be rated at 0.02 perms or less in accordance with ASTM E96 procedures.

Corner beads shall be used on all square corners.

Insulation shall be cut or mitered where necessary to fit the contour of the fittings and equipment. All voids shall be packed with light density glass fiber insulation. Insulation sections shall be

banded in place with 3/4 inch x 0.015 inch thick galvanized steel bands at 18 inch o.c. for all large equipment.

On all cold systems, insulation shall be impaled over welding pins at 12 inches o.c. and secured in place with speed washers. The 3/4 inch steel bands will not be required. Each layer of insulation shall have a vapor barrier cover to provide complete airtight envelope. Vapor-barrier shall consist of one layer of Ludflow foil barrier paper smoothly adhered to the insulation cement surface with vapor-barrier lap adhesive. Lap all joints a minimum of 3 inch and seal with vapor-barrier lap adhesive.

Apply 30 mil PVC cover over vapor barrier in all exposed areas except mechanical rooms. PVC cover shall have solvent welded joints and seams. Piping 10 ft or greater above the floor need not have PVC covering except in the designated wash bay area (plan northwest corner of garage).

1.05 HOT PIPING AND VESSELS:

The following systems shall be insulated with the following minimum thicknesses of glass fiber insulation:

MINIMUM PIPE INSULATION – INTERNATIONAL ENERGY CONSERVATION CODE & ASHRAE 90.1
Based on thermal conductivity (k) of 0.23 btu-in./hour-ft^2-°F
on a flat surface at 75° F. mean

Piping System Types	Fluid Temp. Range Deg.F.	Insulation Thickness for Pipe Sizes 1" & Under	1-1/4" to 1 1/2"	2"	2-1/2" to 4"	5 to 6"	8" & Over
Domestic Systems -							
HW, RHW	Any	1.0	1.0	1.01.5	1.5	1.5	

1.06 COLD PIPING AND VESSELS:

The following systems and services shall be insulated with the following thicknesses of glass fiber insulation including a factory-applied all service jacket and vapor barrier:

	Pipe Sizes ½" through 2"	2-1/2" to 12"
Domestic CW, downspouts, cooling coil drains	1/2"	1"

Insulate all roof drain bodies and seal with vapor-barrier adhesive.

All rods for pipe hangers and metals having direct contact with cold water piping shall be insulated up to 8 inches and sealed same as fittings. Refer to Section 220100 for cold water pipe supports. Pipe hangers shall not be in direct contact with cold piping unless approved by the Architect/Engineer.

Pipe mounting brackets for cold piping shall be large enough to encompass the insulation. This piping shall be anchored securely at the point of connection to plumbing fixtures. The last mounting bracket adjacent to fixtures and equipment may clamp directly onto the pipe. A short length (18 inches maximum) of piping between the last bracket and the plumbing fixture is allowed without insulation.

The following equipment shall be insulated with thickness as noted of rigid, 6 pound density, glass unfaced fiberboard such as OCF Type 705 or equal:

	Pipe Sizes	
	2" & under	2-1/2" & larger
Roof drain bodies		1"

Insulation thicknesses based on thermal conductivity (k) of 0.23 btu-in./hour-ft^2-°F on a flat surface at 75°F.

Insulation greater than 2 inch thickness shall be installed in layers with staggered joints.

1.07 PIPING IDENTIFICATION:

Identify all piping, insulated and uninsulated, except where concealed inside walls or below floors, with 1 inch high black letters designating the type of service and an arrow in the direction of flow. The lettering shall be applied after all painting of the piping is complete as specified in Division 9 - FINISHES. The lettering shall have an identifying word or phrase such as, cold water, gas, sprinkler, low pressure steam return, etc. Each pipe shall be identified in every room, at 30 feet intervals maximum and at each change in direction.

To standardize the lettering and abbreviations, use the following listing:

Domestic Cold Water - (CW).

Hot Water - (HW).

Recirculating Hot Water (RHW).

Vent (Vent).

Downspout (DS).

Air (Air).

Waste (W).

Sprinkler (SPR).

Gas (GAS).

1.08 EQUIPMENT IDENTIFICATION:

All pieces of mechanical equipment shall be identified with an identification name plate to match the name designated on the drawings. Names plates shall not be hand written and shall be permanently fixed to the piece of equipment.

END OF SECTION 220700

DIVISION 23 – VENTILATION AND AIR CONDITIONING

SECTION 230100 - GENERAL PROVISIONS

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

This Section pertains to general provisions and requirements for construction of work specified in all sections of Division 23 herein.

"Contractor" referred to in this Section of the specification implies the Contractor, Subcontractor and/or Subcontractors which are responsible for all or any part of the mechanical installation specified in Division 23 and/or as shown on the Contract Drawings.

Where the specifications in subsequent Sections of Division 23 conflict with requirements of this Section, the specifications in the subsequent Sections shall govern.

The Contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled on the Drawings and/or herein specified, including all labor, materials, equipment, accessories, wiring and incidentals necessary to be installed in accordance with manufacturer's recommendations except as otherwise approved.

1.02 PERMITS AND SERVICE CHARGES:

All permits and service charges necessary for execution of the work under this Contract shall be obtained by and be paid for by the Contractor. It shall be the responsibility of the Contractor to determine the permit requirements of the local authorities and utility companies and the cost of required permits, service charges, tap fees and development fees shall be included in the Contractor's bid.

All work shall be executed in accordance with all local, state and national rules, regulations, codes, etc., which are applicable and shall be subject to inspection by the proper authorities.

1.03 CODES AND STANDARDS:

All work performed and all equipment furnished under this Division of the Contract shall be manufactured and installed in strict accordance with all applicable codes and standards, including the applicable provisions of the following codes and standards.

1. Local and State Codes, Standards and Regulations.
2. National Fire Protection Association (NFPA).
3. National Electric Code (NEC).
4. Underwriter's Laboratory (UL).
5. American Gas Association (AGA) Standards.
6. International Plumbing Code.
7. International Mechanical Code.
8. ASME Boiler and Pressure Vessel Codes.
9. State Boiler Safety Code.
10. American Water Works Association (AWWA).

11. National Sanitation Foundation (NSF).
12. Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA).
13. International Building Code.
14. Life Safety Code.
15. State Energy Conservation Standards.
16. Americans with Disabilities Act (ADA).

All materials installed shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255 and UL 723 not to exceed 25 Flame Spread and 50 Smoke Developed.

1.04 COMPLIANCE:

Where specific requirements of any code vary with the requirements of another code, the higher standard as determined by the Architect/Engineer shall govern the installation.

All equipment manufactured in accordance with the provisions of the above codes and standards shall bear the label of the respective association bureau thereon.

1.05 DRAWINGS:

In general, the Drawings of the mechanical systems and equipment are to scale. However, to determine exact locations of walls and partitions, the Contractor shall consult the architectural and/or structural drawings which are dimensioned. Drawings shall not take precedence over field measurements.

Drawings of piping and ductwork, although shown on scale drawings, are diagrammatic only. They are intended to indicate size and/or capacity where stipulated, approximate location and/or direction, and approximate general arrangement of one phase of work to another, but not the exact detail or exact arrangement of construction. If it is found, before installation of any or all construction phases, that a more convenient, suitable or workable arrangement of any or all phases of the project would result by varying or altering the arrangement indicated on the Drawings, the Architect/Engineer may require the Contractor to change the location or arrangement of the work without additional cost to the Owner. Such rearrangement shall be in accordance with directions from the Architect/Engineer.

Where discrepancies are discovered after certain portions or phases of the work have been installed, the Architect/Engineer reserves the right to require the Contractor to make changes in pipe, duct, fixture or equipment locations or arrangements to avoid conflicts with work at no additional cost to the Owner.

Because the Drawings are to a relatively small scale to show as large a portion as is practical, the fact that only certain features of the system are indicated does not mean that other similar or different features or details will not be required. The Contractor shall furnish all incidental labor, material or equipment for the systems so that each system is a complete and operating one unless otherwise specifically stipulated in the detailed body of the specifications.

The Contractor, Subcontractor's and their respective trades shall cooperate in laying out their work so it will fit properly into the space provided. Promptly report to the Architect/Engineer any delay or difficulties encountered in the installation of this work which might prevent prompt and proper installation, or make it unsuitable to connect with or receive the work of others.

Failure to so report shall constitute an acceptance of the work of other trades as being fit and proper for the execution of this work.

1.06 SUBSTITUTIONS AND PRODUCT OPTIONS:

The Contractor and equipment suppliers shall read and familiarize themselves with articles concerning substitution of materials, as indicated in the Instructions to Bidders. Material and equipment substitutions will be handled as follows:

Materials or equipment specified by name of manufacturer, brand, trade name or catalog reference, shall be furnished under the contract unless changed by Addenda or a Contract modification. Where two (2) or more materials are named, the choice of these shall be optional with the Contractor.

Material or equipment followed by the phrase "or equal" shall establish a standard of required function, dimension, appearance and quality to be met by any proposed substitute. No substitution will be considered unless written request for substitution has been submitted by the bidder and has been received by the Architect/Engineer at least ten days prior to the date for receipt of bids. The Architect/Engineer's decision on a proposed substitute shall be final. If the Architect/Engineer considers any proposed substitution equal, such will be set forth in an Addendum. Bidders shall not rely upon substitutions made in any other manner.

Should the Contractor wish to use materials or equipment other than those specified or listed as equal by Addenda, he shall attach his proposed substitution along with the appropriate add or deduct to the Contract amount, should the substitution be accepted. Substitutions proposed by the Contractor will not be considered in the award of the Contract.

1.07 SHOP DRAWINGS:

Refer to the requirements of the General Conditions. Unless indicated otherwise in the General Conditions, submit to the Architect/Engineer one electronic copy of Shop Drawings for each item of equipment to be installed under this contract. Furnish additional Shop Drawings as required for coordination with General Contractor and other Subcontractors.

To the extent practical, complete sets of shop drawings for each specification section shall be submitted. In the case that a particular item is required to be expedited, that particular item may be submitted individually.

Submit shop drawings in PDF format.

Furnish Shop Drawings as follows:

1. For all major items of equipment or materials, regardless of whether the item is to be furnished as specified.
2. For all equipment, systems or devices where Shop Drawings are specifically called for.
3. For all minor items of equipment or materials where the Contractor proposes to deviate from the specified and/or scheduled manufacturer or material.

The Contractor shall check all Shop Drawing submittals for size, capacity, arrangement, connection locations, materials, finish, color, electrical characteristics, accessories, and shall so

note the Shop Drawings prior to submittal to the Architect/Engineer. Any deviation from the Drawings and Specifications shall be indicated.

Shop Drawings will be reviewed by the Architect/Engineer, and copies of Shop Drawings will be returned to the Contractor. Shop Drawings shall be submitted sufficiently in advance of the construction schedule to allow time for checking Drawings, resubmittal and rechecking when necessary.

Any equipment or material which is installed without authorization by properly processed Shop Drawings will be subject to removal by the Contractor and reinstallation as directed, without cost to the Owner. All cost for repair for damages as may be incurred to the structure as a result of the above correction shall be paid by this Contractor.

Shop drawing material quantities will not be checked by the Architect/Engineer, and review of Shop Drawings by the Architect/Engineer shall not be construed to be verification of the material quantities and sizes shown on the Shop Drawings. Quantities, sizes, dimensions and locations shown on the Drawings and as specified shall determine material requirements.

1.08 CLEANING:

The Contractor and/or Subcontractors for the various phases of the work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished under any or all contracts in a clean first class condition.

Permanent heating and ventilating systems shall not be used during the construction period unless the project site is in a clean and dust free condition and shall be subject to the approval of the Architect/Engineer and Owner.

Surfaces of all coils, fan housings, fan wheels, fan motors, air unit plenums, all air filters, and mechanical equipment shall be wiped clean or washed if required, leaving the installation in a first class condition. All throwaway filters used during construction shall be replaced.

The surfaces of all equipment shall be cleaned, and each item shall be left in a first class condition.

1.09 PAINTING:

Painting of materials and equipment furnished under the mechanical portion of the contract shall be as described in Division 9 - FINISHES. Contractor shall refinish and restore to the original condition and appearance, all mechanical equipment which has sustained damage to the manufacturer's prime and finish coats of enamel or paint. Materials and workmanship shall be equal to the requirements described in Division 9 - FINISHES.

1.10 RECORD DRAWINGS:

The Contractor shall keep a complete set of all mechanical drawings in the jobsite office for purpose of showing the installation of mechanical systems and equipment. This set of drawings shall be used for no other purpose. Where any materials equipment or system components are installed different from that shown on the Architect/Engineer's drawings, such differences shall be clearly and neatly shown on this set of drawings using ink or indelible pencil. At the

completion of the project, the record set of drawings shall be turned over to the Architect/Engineer and shall become his property.

1.11 OPERATING INSTRUCTIONS:

The Contractor shall furnish the Owner two (2) sets of complete catalog data, manufacturer's literature and detailed manuals covering the operation and maintenance of all equipment specified under this Division. All such literature shall be bound in an amply sized three-ring binder and submitted to the Architect/Engineer for approval and for eventual transmittal to the Owner. The manual shall have a Table of Contents at the front of the manual. Before producing hard copies of the manuals, verify with the General Contractor if electronic or hard copy versions of the manuals are to be submitted.

The Contractor shall also supervise the initial operation of all equipment and instruct the operator selected by the Owner in such operation as required to acquaint him thoroughly with the equipment.

1.12 DELIVERY AND STORAGE OF MATERIALS:

Make provisions for delivery and safe storage of materials on the jobsite and make arrangements with other Contractors for introduction into the building of equipment too large to pass through finished openings. Materials to be delivered at such stages of the work as will expedite the work as a whole and marked and stored in such a way as to be easily checked and inspected. All stored equipment shall be protected from the weather conditions and construction debris with a protective covering securely tied in place.

1.13 MECHANICAL PROVISIONS:

Mechanical equipment shall operate without objectionable noise or vibration, as determined by the Architect/Engineer. If such noise or vibration should be produced and transmitted to occupied portions of the building by apparatus, ducts, or other parts of the mechanical work, make necessary changes and additions, as approved, without extra cost to Owner.

Provide oil level gauges, grease cups and grease gun fittings for machinery bearings as recommended by the manufacturer. Extend oil or grease fittings by copper tubing to readily accessible locations.

1.14 CONCRETE BASES:

Concrete bases are required for floor mounted mechanical equipment inside buildings and are specified in Division 3 - CONCRETE. After bases are poured they shall set at least seven (7) days before mounting equipment. The Contractor shall coordinate the setting of expansion bolts in the bases for attachment of equipment and/or isolators.

This Contractor shall verify and coordinate the exact location of the bases and the exact size requirements for specific items of equipment.

As applicable, indoor chillers, condensers, air handling units, fans and other floor mounted mechanical equipment shall be mounted on four inch (or as required) high concrete bases.

1.15 COORDINATION OF WORK:

The Contractor shall process shop drawings and order equipment and materials expeditiously after receiving the Contract and the mechanical installation shall be substantially complete when the general construction work is completed. This Contractor shall confer and cooperate with all other Contractors on this project and shall arrange his work in proper relation to the work of others. Each Contractor shall furnish, install, and maintain in place all anchors, inserts, sleeves, etc., required for his work. Each Contractor will also be held solely responsible for proper size and location of all anchors, inserts, sleeves, chases, recesses, openings, bases, etc., required for proper installation of his work. All cutting and patching made necessary by failure or neglect to coordinate with other Contractors shall be the responsibility of this Contractor. Any cutting or patching shall be subject to the direction and approval of the Architect/Engineer and all damage due to cutting or patching shall be repaired by this Contractor.

After being instructed by this Contractor to do so, the General Contractor will leave all openings in roof, walls, floors, etc., for the passage of ducts, etc. The General Contractor shall also provide concrete bases and roof curbs where shown for mounting the mechanical equipment unless specified otherwise. This Contractor shall verify the exact size and location required for installation of his equipment with the General Contractor.

In general, the Division 26 – Electrical Contractor will provide all power wiring and make one power connection to each item of mechanical equipment, as outlined under Electrical Section.

1.16 GUARANTEE:

All mechanical equipment including equipment used during construction for temporary purposes shall be guaranteed for a period of one year after the time of final acceptance of this work and shall be in like new condition at time of final acceptance.

1.17 TEMPORARY HEATING AND COOLING:

The building heating, ventilation, and air conditioning systems shall not be used for temporary heating, ventilating, or cooling purposes without written approval of the Architect/Engineer.

Use of the building permanent heating, ventilating, and air conditioning systems prior to substantial completion is subject to the written approval of the Architect/Engineer and extended warranties shall be provided at no additional cost.

Duct systems shall not be used during construction without the written approval of the Architect/Engineer. Systems used during construction without written approval, may be required to be professional cleaned or replaced at no cost, as determined by the Architect/Engineer.

Typically, spaces must be completely free from significant dust and dusty construction procedures before approval to utilize the permanent systems will be granted. The Contractor shall provide for temporary heating, ventilating, air conditioning, or dehumidifying systems as needed.

1.18 ELECTRICAL:

Electric Motors:

All electric motor driven equipment being furnished and installed under Division 23 of these specifications shall be complete with electric motors, unless specified otherwise.

All electric motors shall be as manufactured by Westinghouse, Century, Wagner, Allis Chalmers, Reliance, General Electric, or equal. Bearings shall be ball type with alemite lubricating fittings extended to an easily accessible location for field servicing. Minimum service factors for all motors shall be 1.15. All motors shall conform to applicable NEMA standards and all motors specified for use in hazardous locations shall bear the stamp of approval of the Underwriter's Laboratories. All motors, except direct connected motors, shall be furnished complete with cast iron or stamped steel adjustable slide rails. Single phase motors shall be capacitor start type, drip proof, unless specified otherwise. All motors shall be single speed and shall operate at 1,750 RPM, unless specified otherwise.

Horsepower Rating: All electric motors shall be sized to meet the horsepower requirements of the driven unit at design characteristics including all V-belt and/or drive and coupling losses which are incurred without loading the motor beyond its nameplate horsepower rating. Where V-belt drives are employed, the motor horsepower nameplate ratings shall not be less than 120 percent of the driven unit brake horsepower requirements.

Single Phase Motors: Unless specifically noted otherwise, all electric motors shall be designed for operation in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on Drawings or specified, 60 cycle alternating current. Motors shall be thermally protected.

Three Phase Motors: All electric motors shall be designed for operating in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on Drawings or specified, 60 cycle alternating current.

All motors less than 3/4 horsepower shall be 115 volt, single phase unless designated otherwise and all motors 3/4 horsepower and larger shall be as specified in the specific section or as noted on the Drawings.

Premium Efficiency Motors:

Premium efficiency motors shall be furnished on all mechanical equipment where 1 horsepower or larger motors are required.

Motors shall be designed with special stator steel for reduced core losses. Windings shall be oversized copper placed for maximum efficiency. Stator and rotor shall be extra long to reduce flux losses. Frame shall be ODP (unless specified otherwise) of cast iron or cast aluminum construction.

Motors shall be squirrel cage, horizontal base mount, ball bearing, NEMA B design, Class B design, Class B insulation, continuous duty, 1.15 SF, 40 degrees C. ambient.

Minimum nominal full load motor efficiencies shall be based on ASHRAE Standard 90.1 (latest edition).

Furnish and install Aegis SGR, or equal, maintenance free, circumferential, conductive micro fiber shaft grounding rings on all AC motors controlled by adjustable frequency drives to discharge shaft currents to ground.

Motors shall be similar to Louis Allis "Spartan" Series, Gould "E-Plus" Series, or Westinghouse "MAC II" Series. Manufacturer shall furnish proof of efficiency rating.

Motor Starters:

Except where specifically described as being furnished as a part of the equipment furnished and installed under Division 23 of these specifications, all motor starters will be furnished and installed under Division 26, ELECTRICAL.

Electrical Wiring:

Except where specifically described as being furnished as a part of the equipment furnished and installed under Division 23, all electric power wiring shall be furnished and installed in Division 26, ELECTRICAL. The Electrical Contractor will make one power connection to each item of mechanical equipment, unless specified otherwise.

Electrical wiring furnished and installed under these specifications shall conform to all applicable requirements of Division 26, ELECTRICAL.

Unless otherwise indicated, all motors and controls shall be furnished, set in place and wired in accordance with the following schedule:

Item	Division Furnished Under	Set in Place or Mounted Under	Division Wired & Connected Under
Equipment Motors	23	23	26
Magnetic Motor Starters:			
Automatically controlled, with or without HOA switches	26	26	26
Automatically controlled, with or without HOA switches and furnished as part of factory wired equipment	23	23	26
Manually controlled	26	26	26
Manually controlled and furnished as part			

of factory wired equipment	23	23	26
Line voltage thermostats, time clocks, etc., not connected to control panel systems	23	26	26
Electric thermostats, time clocks, remote bulb thermostats, float controls, etc., which are an integral part or directly attached to ducts, etc.	23	23	23
Temperature control panels and time switches mounted on temperature control panels	23	23	23
Damper motors, solenoid valves, EP and PE switches, etc.	23	23	23
Smoke damper operators	23	23	23
Alarm bells	23	23	23
Control circuit feeders	26	26	26
Low voltage controls, thermostats, valves, dampers, etc.	23	23	23
Fire and smoke detectors, including relays for fan shutdown	26	26	26[(1)]
Pushbutton stations, pilot lights	26	26	26
Heat tape	26	26	26
Disconnect switches, thermal overload			

switches, manual operating switches	26	26	26
Multi-speed switches	23	26	26
Contactors	26	26	26
Control relays, transformers	23	26	26

NOTES:

(1) Wiring from alarm contacts to alarm system shall be by the Division 26 Contractor; control function wiring shall be by the Division 23 Contractor.

All control wiring and controls as noted on the Drawings and/or as specified in these specifications shall be provided by this Contractor, including items set in place and wired and connected by the Division 26 Contractor, unless specifically shown otherwise on the Drawings.

1.19 SLEEVES:

Any pipe passing through building construction including walls, floors, roofs or masonry partitions or as noted on the Drawings shall be encompassed with sleeves in accordance with the following:

All pipe sleeves through slabs, floors, masonry walls and masonry partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.

Sleeves shall be provided in all masonry partition walls including locations above suspended ceilings where masonry partition walls extend from floor slab to slab above. Sleeves shall be Schedule 40 steel pipe finishing flush with the wall surface.

Sleeves through exterior building walls shall be Schedule 40 steel pipe with welded flange in the middle of the sleeve and ends finishing flush with finished surfaces. Space between pipe and sleeve shall be packed to provide a watertight joint.

Sleeves through roof slabs and floor slabs in concealed locations shall be No. 22 gauge galvanized steel or crete sleeves (linear polyethylene). Concealed sleeves shall be considered as pipe sleeves in shafts, pipe chases and within walls and partitions.

Sleeves through floor slabs in exposed areas shall be Schedule 40 steel pipe and sleeves shall extend 1/4 inch above the finished floor surface. For slabs in equipment rooms and in other wet areas, sleeves shall be Schedule 40 steel pipe and shall extend 2 inches above finished floor surface.

Floor sleeves in membraned floors shall be furnished with flashing rings and clamps.

All sleeves in exposed locations, except equipment rooms, shall be set so plates specified will cover the sleeves.

All pipe sleeves where wet conditions exist, except sleeves through exterior walls, shall be caulked with a plastic caulking, including sleeves in concealed locations. The space between the pipe and the sleeves shall be packed with oakum and approximately 1/2 inch depth of a polyisobutylene
sealer shall be packed or caulked in both ends of sleeve, even with the ends of the sleeve. The sealer shall be suitable for temperatures from minus 50 degrees to 300 degrees, suitable for painting, non-corrosive and have good adhesion.

Sleeves in fire rated construction, equipment rooms, and/or where designated on the Drawings shall consist of 22 gauge galvanized sheet steel with lock seam joints. Seal sleeves with a fire retardant sealant. When applied according to manufacturer's recommendations, sealant shall have a 3-hour U.L. fire rating.

All sleeves required to provide the proper openings in masonry construction for the passage of ductwork, mechanical equipment, etc., shall be furnished and installed by this Contractor. These sleeves shall also be removed by this Contractor after the opening has been formed. The opening around all ductwork, equipment, etc., passing through slabs, floors, walls and partitions shall be sealed as specified above for piping. Fire/smoke dampers shall be installed in accordance with the manufacturer’s installation instructions.

All sleeves shall be set and maintained in place by this Contractor during the progress of the work. This Contractor shall be responsible for locating all sleeves at the proper location.

Sleeves are not required for core drilled masonry wall and floor holes, masonry wall and floor holes formed by polyethylene plastic (removable) sleeves, or for masonry holes made in another neat manner except in equipment rooms and other wet areas.

Sleeves are not required in metal or wood stud wall construction. Rated systems shall be provided as required to provide the necessary rating of the penetration.

Interior wall sleeves are only required on cold insulated piping (refrigerant suction piping, etc.). All other steel or cast iron piping 4 inches and smaller shall be grouted directly into the wall as necessary to provide the required fire and smoke rating. Piping larger than 4 inch size and all non-rated piping shall be provided with a rated system.

Firestopping materials shall be 3M, Hilti, MetaCaulk, Nelson or equal.

1.20 WALL, FLOOR AND CEILING PLATES:

Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. Finished areas shall be those areas which are painted or have special finishes within the room. The wall plates shall be a minimum of 3/32 inch thickness and shall have set screws or spring locks for clamping to the piping. The plates shall be chrome-plated steel, cast iron or brass and shall set tight against the wall.

1.21 EQUIPMENT SUPPORT:

Furnish and install all necessary wall backing, brackets, braces, plates, angles, wall hangers, etc., required for properly supporting mechanical equipment and mechanical appurtenances. All supports shall be securely anchored with lead inserts, expansion shields, through-going bolts, lag screws or other devices as required.

All items of mechanical equipment hung from overhead structure shall be hung from 2-1/2 inches by 2-1/2 inches by 3/16 inch angles minimum which shall span at least 3 members, unless noted otherwise.

1.22 EXISTING SERVICES:

The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.

All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of the service if possible.

All inactive services which are encountered shall be protected or removed as directed by the Architect/Engineer, Owner, Utility Company or Municipal Agency having jurisdiction. The service shall also be plugged or capped as directed.

When active services must be temporarily interrupted, the interruption shall be scheduled at night or at such time as approved by the Owner or authority having jurisdiction and so as to cause the minimum of interference with establishing operating routine. Arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

1.23 EXCAVATION:

Trenching and excavation for all underground piping and equipment shall be excavated to the required depths. The bottom of the excavation shall be tamped hard and graded to secure the required fill. Rock, where encountered, shall be excavated to a depth of 6 inches below the bottom of duct or pipe and before duct or pipe is laid, the space between bottom of pipe and rock surface shall be filled with gravel.
After the installation has been tested, inspected and approved by the Architect/Engineer and prior to backfilling, the forms shall be removed and the excavation shall be cleaned of trash and debris. Materials for backfilling shall consist of the excavation, or borrow of sand or gravel, and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in thickness, and properly moistened. Backfill inside the building and under any exterior slabs or other paved areas shall be compacted by hand or mechanical means to the density of 95 percent Proctor and areas outside the building not covered by concrete slabs or other structures or pavement shall be compacted to the density of the adjacent undisturbed soil. Any settling within the one (1) year guarantee period shall be repaired at no cost to the Owner.

1.24 ACCESS TO EQUIPMENT:

Access shall be provided to all motors, valves, dampers, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The location of the access openings relative to the mechanical equipment shall be coordinated to assure proper access to the equipment. The door shall maintain any ratings of the wall, ceiling, etc. that it penetrates.

Access openings are required for valves, manual, motorized, fire, and smoke dampers and other devices requiring access and shall be provided in the ductwork, plenums, housings, tanks, walls, ceilings, etc., under this portion of the Contract.

1.25 PROTECTIVE DEVICES:

All sheaves, belts, drives, couplings, and moving parts shall be protected by approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

All pressure and/or temperature relief valves shall have the discharge piped full size to within 6 inches of the floor or floor drain. The piping shall be securely anchored. All relief valves shall be ASME approved and proper size for the application.

1.26 PIPING CONNECTIONS:

Furnish and install unions or mating flanges at all connections to each piece of equipment, conveniently located to facilitate quick and easy disconnecting of equipment for replacement, tube cleaning or general maintenance. Flanged or union connections shall be used on both sides of equipment. Unions or flanges shall be of the same material or finish as the piping systems in which they are installed. Unions are not required for grooved pipe systems.

1.27 FLEXIBLE CONNECTORS:

Furnish and install flexible connectors on all piping connections to rotating equipment such as compressors, condensing units, etc., and where shown on the Drawings. Flexible connectors shall also be installed at all locations where necessary to prevent damaging stresses to piping, equipment, or building structure, and where necessary to isolate noise at its source.

Flexible connectors for refrigerant piping shall be close pitch annular corrugated phosphor bronze hose and bronze braid for refrigerant piping and non-ferrous piping systems, Flexonics Type PCB or equal.

Flexible connectors shall be installed in strict accordance with manufacturer's recommendations and shall be constructed of material specified herein, unless recommended otherwise by the manufacturer for specific applications. All piping shall be anchored to prevent elongation or compression of the flexible connectors.

Flexible Connectors shall be Kinetics, Proco, Mercer, Flexonics, Twin City Hose, Inc. or equal.

1.28 PIPE HANGERS, SUPPORTS AND ANCHORS:

Anchors as shown and detailed on the Drawings and specified herein and/or as required. All support components shall conform to Manufacturer's Standardization Society Specification SP-58. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustment to maintain pitch required for proper drainage. They shall allow for expansion and contraction of the piping. On other than vapor barrier insulated lines, hangers shall bear directly on piping.

Hangers shall be constructed of malleable or wrought iron unless noted otherwise, and hangers supporting copper pipe shall be copper plated. Hangers for pipe 3 inches and smaller shall be band and socket Michigan Model No. 100 or equal. For piping over 3 inches, hangers shall be adjustable, Clevis type, Michigan Model No. 400 or equal.

Where groups of three or more pipes occur, they may be supported with trapeze hangers using two hangers as specified with a capped pipe cross member.

Where clearance between pipe and overhead support is insufficient for the use of other hangers specified, use Michigan Model No. 605 or equal.

Horizontal steel piping shall be supported as follows:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1-1/4 inch	3/8 inch	8 feet
1-1/2 inch & 2 inch	3/8 inch	10 feet
2-1/2 inch & 3-1/2 inch	1/2 inch	15 feet
4 inch & 5 inch	5/8 inch	15 feet
6 inch	3/4 inch	17 feet
8 inch through 12 inch	7/8 inch	22 feet

Horizontal copper piping shall be supported as follows:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1 inch	3/8 inch	6 feet
1-1/4 inch & 1-1/2 inch	3/8 inch	8 feet
2 inch	3/8 inch	9 feet
2-1/2 inch	1/2 inch	9 feet
3 inch & 4 inch	1/2 inch	10 feet

For vertical piping, where supports are not indicated on the Drawings, support steel and copper pipe at every other floor.

Pipe hangers shall not be attached to the roof deck. Hangers shall be attached to the structure with beam clamps, beam attachment and brackets bolted to joists and beams. Use Michigan Model No. 340 or equal, steel washer plates for pipe supported from steel joist. The Contractor shall endeavor to hang near joist panel joints wherever possible.

Pipe hangers for cold piping, refrigerant suction piping and all insulated piping on trapeze hangers shall be large enough to encompass the insulation, using a metal shield so the vapor barrier jacket will not be broken. See Insulation Section.

Pipe mounting brackets for cold piping shall be large enough to encompass the insulation B-Line Model B2417 or equal. This piping shall be anchored securely at the point of connection to equipment. The last mounting bracket adjacent to equipment may clamp directly onto the pipe. A short length (18 inches maximum) of piping between the last bracket and the connection is allowed without insulation.

Hanging from one pipe to another is prohibited.

Pipe anchors shall consist of heavy steel collars with lugs and bolts for clamping and attaching anchor braces, unless otherwise shown on the Drawings. Anchor braces shall be installed in the most effective manner to secure the desired results, using turnbuckles where required. No supports, anchors, and stays shall be attached in places where they will injure the construction either in installation or by the weight or expansion of the pipe line.

Pipe Hangers shall be Michigan, Grinnell, PHD, B-Line or equal.

1.29 PIPING INSTALLATION:

All pipes shall be round and straight, of required size. Cutting shall be done with proper tools and pipes shall be reamed to full size after cutting.

Piping shall be properly enclosed, supported, guided, anchored, sway braced, connected, tested, cleaned and flushed out and shall be properly insulated and protected where required.

All pipes shall be run with proper grade to provide for easy draining and in group runs where applicable and in a neat and orderly manner, to the satisfaction of the Architect/Engineer. Lines required to be enclosed in ceiling, chaseways or similar spaces shall be installed to permit such enclosure as intended. All pipe runs shall be carefully laid out and scheduled to avoid necessary interferences with other work. Pipe sizes shown on the Drawings are nominal pipe sizes and not outside diameters.

Pipes shall be run substantially as indicated on the Drawings. However, the Architect/Engineer reserves the right to require this Contractor to make changes in pipe locations where conflicts occur with other trades. Such changes shall be made without extra cost to the Owner.

Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Such provision shall be made by means of piping offsets, changes in direction, expansion loops and/or suitable expansion joints. Suitable anchors and guides shall be provided to permit proper deflection and compression of offset loops and expansion joints. Expansion joints shall not be used in lieu of offsets, changes in direction or loops, except where specified and/or indicated on the Drawings or where otherwise obviously necessary.

Exposed piping shall be installed in a sanitary manner for ease in cleaning.

Equipment piping shall also include wastes and drains which are safe-wasted without a direct connection.

Minimum grade for horizontal drainage piping shall be 1/4 inch per foot for 3 inch diameter piping or less, 1/8 inch per foot for 4 inch and 6 inch diameter piping and 1/16 inch per foot for drainage piping over 6 inch diameter.

END OF SECTION 230100

SECTION 230700 - INSULATION AND PIPING IDENTIFICATION

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

Section 230100, General Provisions, in its entirety, including references to the General Construction Specifications are hereby adopted and made part of these specifications.

The work involved in this specification and the accompanying Drawings consists of performing all labor and furnishing of all labor, materials, fixtures, and equipment necessary to install complete piping, ductwork, and equipment insulation as described herein and/or as shown on the Drawings. This includes all equipment and materials obviously necessary for complete systems though not specifically mentioned or shown.

1.02 MATERIALS AND WORKMANSHIP:

All covering and insulating materials used on this project must contain the manufacturer's name on the containers. All materials must be dry and in good condition, free of defects, mildew, rough ends, etc. Insulation materials shall be Anco, Certainteed, Owens-Corning, Johns Manville, Armstrong, Knauf or equal.

All insulation work shall be performed by an Insulation Contractor who uses workers skilled in this type of work. Only first class workmanship will be acceptable. The Insulation Contractor shall submit shop drawings for all materials proposed to be installed in this project.

All pipe covering shall have a density of not less than 3-1/2 pounds per cubic foot.

All materials shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255, AND U.L. 723 not to exceed 25 Flame Spread and 50 Smoke Developed.

1.03 EQUIPMENT INSULATION:

Insulation shall be cut or mitered where necessary to fit the contour of the fittings and equipment. All voids shall be packed with light density glass fiber insulation. Insulation sections shall be banded in place with 3/4 inch x 0.015 inch thick galvanized steel bands at 18 inch o.c. for all large equipment. Insulation shall be covered with one inch galvanized hexagonal wire mesh. Apply 1/2 inch of insulating cement such as OC-110 or equal in 2 layers over the wire mesh.

Cover with 30 mil PVC cover in all exposed areas except mechanical rooms. PVC cover shall have solvent welded joints and seams. Piping 10 ft or greater above the floor need not have PVC covering except the designated wash bay area (plan northwest corner of garage).

On all cold systems, insulation shall be impaled over welding pins at 12 inches o.c. and secured in place with speed washers. The 3/4 inch steel bands will not be required. Each layer of insulation shall have a vapor barrier cover to provide complete airtight envelope. Vapor-barrier shall consist of one layer of Ludflow foil barrier paper smoothly adhered to the insulation cement surface with vapor-barrier lap adhesive. Lap all joints a minimum of 3 inch and seal with vapor-barrier lap adhesive.

1.04 COLD PIPING AND VESSELS:

Refer to Section 230100 for cold pipe supports. Pipe hangers shall not be in direct contact with cold piping unless approved by the Architect/Engineer.

All piping exposed to outdoor weather conditions shall be additionally covered with 30 mil PVC jacket sealed watertight. PVC cover shall have solvent welded joints and seams.

Pipe mounting brackets for cold piping shall be large enough to encompass the insulation.

1.05 DUCT INSULATION - EXTERNAL:

All exhaust and relief ductwork routed through cold spaces, and all outdoor air ductwork and combustion air ductwork shall be insulated with 1-1/2 inches of external insulation. All round supply air ductwork, except exposed round ductwork in conditioned spaces, shall be insulated with 1 inch of external insulation.

In ducted return systems where ceiling cavities are not return air plenum spaces, externally insulate duct mounted or VAV box mounted reheat coil casings and exposed tubes to prevent condensation.

Insulate all drip pans and ducts through the roof or sidewalls with 1 ½ inches of external insulation. All ducts through the roof or sidewalls shall be insulated for a minimum distance of 4'0" laterally from the opening. This shall apply to all relief and exhaust air openings.

External duct insulation in exposed locations shall be 3 pound density Owens-Corning Fiberglass FSK rigid board insulation for cold equipment down to minus 60 degrees F., or equal. Insulation shall be cut to fit between standing seams and stiffeners and shall be secured to ductwork by impaling over pins located not more than 12 inches o.c. or more pins if necessary to provide a tight fit to the ductwork. All joints shall be tightly butted and taped. Cover all pin penetrations and all joints with OCF joint sealing tape or equal. Take special care in applying the tape to prevent dust from fouling the tape. The complete installation of external duct insulation shall follow the instructions of the manufacturer of the insulation used. Complete system shall be U.L. rated and meet NFPA Fire Hazard Classification.

External duct insulation in concealed locations shall be 1 pound density Owens-Corning Fiberglass Faced Duct Wrap Series ED 100 FRK-25, or equal. Insulation shall be wrapped tightly on the duct work with all circumferential joints butted and longitudinal joints overlapped a minimum of 2 inches. Adhere insulation to metal with 4 inch strips of insulation bonding adhesive at 8 inch o.c. Additionally secure insulation to the bottom of rectangular duct work over 24 inches wide with mechanical joints, the 2 inch flange of the facing shall be secured using 9/16 inch flare-door staples applied 6 inches o.c. and taped with minimum of 3 inch wide foil reinforced kraft tape. On longitudinal joints, the overlap shall be secured using 9/16 inch flare-door staples applied 6 inch o.c. and taped with minimum 3 inch wide foil reinforced kraft tape. All pin penetrations or punctures in facing shall also be taped.

Wrap duct at penetrations of fire or smoke barriers with firestop insulation, seal jacket seam and seal end joints to adjacent sections of insulation. Seal opening between insulation and sleeve with firestopping material.

1.06 DUCT INSULATION - INTERNAL:

All rectangular supply and return ductwork shall be insulated with 1 inch of internal insulation.

Internal duct insulation shall be Owens-Corning Fiberglass Duct Liner or equal, 1-1/2 pound density, and have a thermal conductivity of 0.28 at 75 degrees F. mean temperature. The surface shall be coated with a black fire-resistant neoprene coating meeting NFPA 90A Standards and shall have no air erosion of the fibers with air velocities up to 6,000 fpm. Increase duct size to accommodate liner. Adhere liner, with coated side towards air stream, to all interim sides of duct with 100 percent coverage of fire resistant insulation bonding adhesive such as Benjamin Foster No. 81-20, 3M spray adhesive No. 77, or equal. When duct width or height exceeds 20 inches for horizontal ducts and 12 inches for vertical ducts, further secure the liner to these surfaces with mechanical fasteners at 15 inch o.c. Top pieces shall be supported by the side pieces. All edges and joints shall be coated with adhesive.

Velocities - 2,000-4,000 fpm: For all ducts exceeding 16 inches in height and 12 inches width, further secure the liner to these surfaces with mechanical fasteners at 15 inch O.C. The dimensions shall be reduced to 12 inches for vertical ducts.

Velocities - 4,000-6,000 fpm: Install as above except that mechanical fasteners shall be spaced 12 inches o.c. on all surfaces and metal noising shall be installed to secure liner at all upstream traverse edges.

1.07 PIPING IDENTIFICATION:

Identify all piping, insulated and uninsulated, except where concealed inside walls or below floors, with 1 inch high black letters designating the type of service and an arrow in the direction of flow. The lettering shall be applied after all painting of the piping is complete as specified in Division 9 - FINISHES. The lettering shall have an identifying word or phrase such as, cold water, gas, sprinkler, low pressure steam return, etc. Each pipe shall be identified in every room, at 30 feet intervals maximum and at each change in direction.

To standardize the lettering and abbreviations, use the following listing:

Refrigerant (R-454b, R-32, etc.).

1.08 EQUIPMENT IDENTIFICATION:

All pieces of mechanical equipment shall be identified with an identification name plate to match the name designated on the drawings. Names plates shall not be hand written and shall be permanently fixed to the piece of equipment.

END OF SECTION 230700

SECTION 230800 - VENTILATION AND AIR CONDITIONING

1.01 SCOPE:

The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.

Section 230100 General Provisions, in its entirety, including references to the General Construction Specifications are hereby adopted and made part of these specifications.

The work involved in this specification and the accompanying Drawings consists of performing all labor and furnishing of all materials, fixtures and equipment necessary to install complete ventilation and air conditioning systems as described herein and/or as shown on the Drawings. This includes all ductwork, equipment, wiring and materials obviously necessary for complete systems though not specifically mentioned or shown.

See Section 230700 for insulation requirements.

1.02 DUCTWORK:

All ductwork is to be galvanized iron fabricated and erected in a workmanlike manner. Fabricate plenums and special fittings, as shown on the Drawings, or as required. Access doors to plenums shall be double wall construction with heavy hardware. All ductwork shall be of the gauges hereinafter specified and constructed to the best grade Inland, U.S. Steel, United Sheet Metal or equal brands, with G90 galvanization.

Metal gauges for low pressure duct systems shall be of metal gauges and reinforcing as recommended by SMACNA or as follows:

Maximum Dimension of Rectangular Ducts or Diameter of Round Low Pressure Ducts	Galvanized Sheet Steel Gauge Number
Up thru 12"	26
Over 12" thru 30"	24
Over 30" thru 54"	22
Over 54" thru 84"	20
Over 84"	18

Ductwork shall be constructed, braced, reinforced and sealed as recommended by ASHRAE and SMACNA. Environmental air ductwork as defined by the International Mechanical Code shall be substantially air tight. Low pressure ductwork shall be suitable for pressures up to 2 inch w.g. All ductwork 18 inches and greater in width shall be cross-broken. See SMACNA requirements for proper sealing of ductwork.

Non-proprietary T-24, proprietary TDC/TDF flanges and Ductmate 35/25 may be used for transverse joint construction where the longest side is 35 inches or smaller. Ductwork with the longest side 36 inches and over shall be constructed using Ductmate 35/25 or equal slide on systems, per Ductmate Industries Installation Procedures and Duct Construction Standards, latest

edition. The non-proprietary SMACNA T-22 Flanged Connection may be used as defined on Page 1.63, 1.64 and 1.80, of the 1995 SMACNA Manual, Second Edition. Ductmate 440 Butyl Gasket, or equal, shall be used between all rectangular transverse flanged duct connections, Ductmate's 440 Butyl Gasket, shall be used with the Ductmate Systems. For rectangular ductwork located outdoors, exposed to weather, construct ductwork per, "Transverse Joints Rectangular" with a continuous metal cleat on top joints of ducts for added weather protection. Slide on systems shall be Ductmate, Ward Industries, Inc., or equal.

No obstruction shall be permitted in the ductwork to retard the flow of air. If it is necessary to run a pipe or conduit through a duct, the duct size shall be increased to compensate for the obstruction.

Where space permits, duct turns shall be constructed with an inside radius equal to or greater than the duct width or duct turn vanes may be used. Where space does not permit duct turns as described above, duct turn vanes shall be used. Where space permits, duct offsets 30 degrees and greater shall be constructed with an inside radius equal to or greater than the duct width.

Where interior duct insulation is required, increase the duct size to maintain the free area shown on the Drawings.

Provide exterior insulated drip pans, 3 inches deep, under or adjacent to all roof and wall openings including but not limited to under all intake or relief hoods and louvers. Drip pans to be soldered watertight.

Power operated dampers not furnished as a component of the ventilating machines will be furnished under the Temperature Control Specifications. They shall be installed in the ductwork under this specification. Caulk around all sides of high efficiency damper frames.

Flexible connections shall be installed between suction and discharge openings in fan units and the ducts with which they are connected to prevent transmission of vibration noises. Material shall be watertight and fire retardant canvas weighing not less than 20 ounces per square yard, or shall be glass fabric on high temperature systems where fire hazard exists. Both materials shall be approved by Underwriter's Laboratories. The flexible material shall be furnished with all necessary angles, bolts, clips or other fasteners. Flexible connections are not required on fan units with internal fan isolation, such as Air Handling Units or Power Roof Ventilators. Fan Powered VAVs and Fan Coil Units shall have flexible connections at the supply discharge duct. They shall have flexible connections at the return inlet duct if ducted to a return grille.

Furnish and install access panels in the ductwork adjacent to all motorized dampers, fire dampers, louvers, reheat coils, and equipment which may require servicing or cleaning. Panels shall be tight fitting and shall be located so as to make them easily accessible. All panels installed in insulated ductwork shall be double wall, insulated type. Panels shall be Ruskin, Air Balance, Ventlok, ADCO, or equal.

Dynamic rated fire dampers shall have an 18 inch square access panel or an 18 inch long removable duct section shall be installed adjacent to dynamic rated fire dampers in addition to a smaller inspection access panel. The removable section shall be assembled using Ductmate or equal duct joints. The joint at the damper shall be assembled with plastic fastener clips. Ductwork 24 inches and wider shall have an 18 inch by 18 inch access door in lieu of removable section.

Ductwork installed above UL fire rated ceiling assemblies shall be installed in strict accordance with the provisions required by the UL Design Number designated in the Underwriters Laboratories Fire Resistance Directory.

All ductwork visible through the face of a register or grille shall be painted with a flat black paint.

All rigid and flexible ductwork materials installed shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255 and UL 723 not to exceed 25 Flame Spread and 50 Smoke Developed.

Concealed low pressure round ductwork may be rigid spiral ductwork or snaplock type with adjustable elbows.

All exposed round ductwork shall be United, Semco, Norlock, Foremost, SMC, SPOT or equal, rigid spiral duct and fittings. Tee fittings shall be factory built tee fittings or equal. Saddle branch takeoff fittings are not acceptable except as approved by the Architect/Engineer.

Round ductwork shall be supported at 6 feet o.c. where building framing does not provide such support. Support shall be minimum 3/4 inch metal strap suspended from the roof or framing.

Flexible duct shall not exceed 8 feet in length or pass through walls. Flexible round ductwork may only be used for final connections to supply registers and diffusers in concealed locations.

All round sheet metal supply air ductwork, except exposed, shall be insulated with 1 inch thick of Owens-Corning Fiberglass Faced Duct Wrap Series ED-100 FRK-25 or equal.

1.03 REGISTERS, GRILLES AND DIFFUSERS:

Furnish and install all registers, grilles and diffusers as specified hereinafter and as designated on the Drawings. Opposed blade, heavy duty dampers shall be used on systems having two or more duct openings where balancing of air discharge or intake is required. Grilles may be used where there is only one opening and where balancing is not required.

Diffusers, registers, and grilles shall be provided as listed in the schedule on the Drawings. All registers, grilles and diffusers shall be of size and capacity with special requirements, frames, dampers, blank-off baffles, etc., as listed in the schedule and as designated. Opposed blade, heavy duty dampers shall be provided on all units unless designated otherwise on the Drawings.

Louver faced ceiling diffusers shall have a minimum of three (3) inner diffuser cones plus the outer shell unless scheduled otherwise.

The installed location of all ceiling diffusers, registers, and grilles shall be as shown on the Reflected Ceiling Plans.

The finish on all aluminum registers, grilles and diffusers shall be etched to a lustrous satin finish and coated with a clear acrylic lacquer, or white finish as noted below and/or on the Drawings. All steel units shall have white enamel finish, unless noted otherwise. Interior of perforated diffusers shall be painted black.

All ceiling mounted registers, grilles and diffusers shall be white unless noted otherwise. All floor mounted registers, grilles and diffusers shall be satin anodized without mounting holes unless otherwise noted.

Ceiling registers, grilles and diffusers in fire rated ceilings shall have an outer cone of 24 gauge (minimum) steel construction and shall have UL Fire Resistance Classified fire dampers with radiation shields.

Registers, Grilles and Diffusers shall be Tuttle and Bailey, Carnes, Anemostat, Titus, J & J Register, Metal Industries, Grillmaster, Krueger, Price, Reliable, Nailor or equal.

1.04 FURNACE (HIGH-EFFICIENCY):

Furnace shall be high efficiency type with 91% minimum Annual Fuel Utilization Efficiency. Furnace shall be natural gas-fired type with capacity not less than shown on the Drawings. Furnace shall be AGA-approved and UL-listed.

Furnace cabinet shall be furniture-grade steel with rust-protective coating and with a finish coat of baked enamel.

The combustion chamber shall be cast iron, aluminized steel, and stainless steel. Provide air and gas inlet valves, spark igniter, and flame sensor to verify combustion. The heat exchanger shall be warranted for 10 years from date of Owner's acceptance.

The blower shall be centrifugal type, rated for "high" static pressure for use with a cooling coil, and shall be belt-driven or directly connected to a changeable-speed motor of capacity not less than that shown on the Drawings.

Controls shall include, 110 to 24-volt transformer, high-limit switch and fan control, 100% shutoff gas valve with separate, automatic safety shutoff valve, electric gas valve and pressure regulator and cooling relay for interlock with the condensing unit.

Provide cooling coil casing to match and line up with the furnace, with direct-expansion cooling coil of capacity not less than shown on the Drawings. Coil shall be provided with refrigerant expansion valve. Provide precharged line sets to connect the coil to the condensing unit.

Filters shall be 1" thick disposable frame type pleated media filters shall have 30 percent efficiency based upon ASHRAE Standard 52-68.

Provide a 7-day wall programmable electronic thermostat with a subbase to control the unit on heating or cooling. Switches shall allow selection of Heat-Off-Cool or Fan-On-Auto. Thermostats shall have a programmable fan switch with auxiliary contacts. Thermostats shall be White Rogers Digital Comfort Set III or equal.

Provide PVC air intake and vent pipe to the outside. Provide vent/intake wall or roof terminal kits furnished by the manufacturer.

Install the furnace level and on the isolation mounting pads furnished with the furnace. Install the base insulation pad as recommended by the manufacturer. Install the air intake and vent pipe, and extend the drain from the furnace to an adequate drain point. Provide adequate room in front of

the furnace for service and to the sides for pipe and ductwork required. Install the coil casing and coil on the furnace as
directed by the manufacturer. Seal all air leaks with sheet metal for a neat and proper installation. Make the necessary return, outside air, and supply air duct connections to the furnace using noncombustible fabric connectors.

Operate the furnace and check operation of all controls, including the safety controls.

Furnace shall be Lennox, Trane, York, Carrier or equal.

1.05 GAS FIRED UNIT HEATER:

Furnish and install gas fired horizontal unit heaters where shown and scheduled on the Drawings. Heaters shall be complete with tubular aluminized steel heat exchanger, aluminized steel burner, direct-drive propeller fan, fan guard, totally enclosed motor, adjustable vertical and horizontal discharge louvers, automatic operating and safety controls, 100 percent safety shut-off, wall-mounted thermostat for each unit, and steel cabinet with baked enamel finish. Heaters shall be certified by A.G.A. and CSA approved.

Heaters shall have capacities as listed in the schedule on the Drawings.

Fan motor shall be totally enclosed type, 115 volt, single phase motor with either integral motor overload protection and disconnect switch with thermal overload.

Heaters shall be suspended from the overhead structural system with two 1/2 inch rods. Mounting height shall be as high as possible with proper clearance below unit.

Unit shall have a separate combustion air inlet connection. Provide a concentric wall or roof combustion air inlet kit, as shown on the drawings.

Heaters shall be Reznor, Lennox, Carrier, Beacon Morris, Hastings Industries, Trane, Modine, Sterling, Rapid or equal.

1.06 CONDENSING UNIT:

Furnish and install condensing units where shown on the Drawings. Unit shall be complete with condenser, condenser fan, louvered coil guard, compressor, low ambient lock out, controls for operation down to 0 degrees F. ambient temperature, operating and safety controls factory installed. Unit shall be ARI certified, Underwriter's Laboratories listed and CSA approved.

Unit capacity shall be as listed in the schedule on the Drawings.

Cabinet shall be constructed of galvanized steel with baked enamel finish and sound insulated compressor compartment.

Insulate suction piping with 1/2 inch thickness Armaflex insulation. Outdoor insulation shall be additionally covered with 20 mil PVC cover having solvent welded joints and seams.

Shop drawings of the refrigerant piping shall be submitted as specified in Division 1 of the Contract. The shop drawings shall incorporate the following:

Diagrammatic layout of the piping showing the general arrangement of the refrigerant piping length, fittings, equipment and elevations.

Refrigerant piping sizes.

The Contractor shall verify the acceptability of the refrigerant piping arrangement and sizes with the refrigeration equipment supplier/manufacturer.

Condensing Unit shall be of the same manufacturer as the furnace.

1.07 REFRIGERANT PIPING AND SPECIALTIES:

The Contractor shall furnish and install refrigeration piping, as detailed on the Drawings and as required.

Insulate suction piping with 1/2 inch of fire and smoke rated Armaflex, or equal. The insulation shall not exceed ratings of 25 Flame Spread and 50 Smoke Developed as rated by UL 723. All insulation exposed to outdoor weather conditions shall be additionally covered with a 20 mil PVC jacket sealed watertight. The PVC cover shall have solvent welded joints and seams. Piping support brackets shall be B-Line Model B2417 or equal. The insulation shall run continuous through the brackets with hanger shields.

The Contractor shall follow recommendations of the equipment manufacturer when piping, installing, and starting the systems.

Specialties shall include a charging valve, flexible connectors, condenser plunge valve and condenser shut-off valve on each system, as required for operation. Provide sight glasses, dryers, strainers, solenoid valves, expansion valves, etc., as noted on the Drawings and/or as required for proper operation.

Accessories shall be Henry, Sporlan, Alco, or equal.

Refrigerant piping shall be type "L" copper tubing, hard drawn with wrought copper solder type fittings suitable for connection with silver solder. The piping shall be charged with dry nitrogen while constructing the joints. A removable type dryer strainer shall be installed in the liquid line. A three valve bypass shall be provided for the strainer. After the refrigerant piping has been completed, the refrigerant system shall be pressure tested at a pressure of 300 psi (high side) and 150 psi (low side). While the system is being pressure tested, an electronic leak detector shall be used to check for leaks. Pressure shall be maintained on the system for a minimum of 12 hours. The system shall be evacuated when the surrounding ambient air is not less than 60 degrees F. A minimum vacuum of 5.2 MM of mercury absolute shall be pulled on the system and maintained for 24 hours. The vacuum pressure displacement shall be not less than 5 cfm. The vacuum shall be checked with an electronic gauge. All pipe shall be supported from the building structure in a neat and workmanlike manner and wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze type hangers. The use of wire or perforated metal to support piping will not be permitted. Hanging piping from other piping will not be permitted. Spacing of pipe supports shall not exceed 8 feet for pipes up to 1-1/4 inches and 10 feet on all other piping. Hangers shall pass around the insulation and an 18 gauge steel protective band, 12 inches long shall be inserted between the hangers and the insulation.

1.08 REFRIGERATION SYSTEMS (except precharged systems):

Piping Tests: After the refrigeration piping and fittings have been assembled, all flux shall be removed from connections and all lines shall be clean. The piping system shall be blown out with dry nitrogen to remove any free water or dirt which might be present. The refrigerant lines shall be charged with dry nitrogen and proven tight at minimum gauge pressures of 300 psi on the high side and 150 psi on the low side. The system shall hold these pressures for a period of 24 hours without pressure drop except for pressure change due to temperature differential.

Evacuation and Dehydration: After the piping system has been proven tight by the pressure test, evacuation and dehydration of the system shall be accomplished using the double evacuation method described in the following paragraphs.

Equipment and Conditions: The Contractor shall provide a two-stage, high vacuum pump capable of pumping down to 100 microns or lower while evacuating the system, and of adequate displacement to evacuate the various systems within a reasonable period of time based upon maximum vacuum of 5.16 millimeters of mercury absolute. He shall also provide a wet-bulb vacuum indicator, a supply of 100 percent methyl alcohol for use with this instrument and a temperature-pressure conversion chart for 100 percent methyl alcohol. The evacuation shall be done only when the ambient air temperature is 50 degrees F. or higher. The Contractor is cautioned to go no lower than 5.16 millimeters of mercury absolute on the evacuation procedure to prevent the formation of ice in the piping system.

Primary Evacuation: This procedure begins after the vacuum pump and wet-bulb vacuum indicator have been properly attached to the piping system. The vacuum pump is operated continuously until the pressure within the system reaches 5.16 millimeters of mercury absolute at which point the pump is stopped.

Secondary Evacuation: Using the same dry refrigerant with which the system is to be charged, break the vacuum and bring the system pressure to a point slightly above atmospheric pressure. Start the vacuum pump and using the wet-bulb vacuum indicator, evacuate the system to 5.16 millimeters of mercury absolute. Stop the vacuum pump and charge the system with a full charge of dry refrigerant.

Operating Tests: The systems shall be operated as near as possible to design conditions for 48 hours, not necessarily continuous. During this time sufficient data shall be logged to provide proof of satisfactory operation. The collected data shall be submitted to the Architect/Engineer for approval. The Architect/Engineer shall be given advanced notice of the testing period so he may be present for observation of same should he desire. At the expiration of the test period all systems shall be fully charged and free of leaks.

1.09 SQUARE CENTRIFUGAL IN-LINE FAN:

Square Centrifugal In-Line Fans shall be centrifugal belt drive or direct drive type, as scheduled on the drawings. The fan housing shall be constructed of heavy gauge galvanized steel and shall include duct mounting collars.

Fan construction shall include two removable access panels located perpendicular to the motor mounting panel. The access panels must be of sufficient size to permit easy access to all interior components.

The fan wheel shall be centrifugal backward inclined, constructed of aluminum and shall include a wheel cone carefully matched to the inlet cone for precise running tolerances. Wheels shall be statically and dynamically balanced.

Motors shall be heavy duty ball bearing type, carefully matched to the fan load and furnished at the specified voltage, phase and enclosure. Motors shall be readily accessible for maintenance.

Where scheduled on the drawings, provide an electronically commutation motor (ECM) specifically designed for fan applications. When scheduled, EC motors shall be permanently lubricated with heavy-duty ball bearings to match the fan load and prewired to the specific voltage and phase. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed. Speed shall be controlled by a potentiometer dial mounted on the motor or by a 0-10 VDC input signal. Motor shall be a minimum of 85% efficient at all speeds.

For belt drive units, precision ground and polished fan shafts shall be mounted in permanently sealed, lubricated pillow block ball bearings. Bearings shall be selected for a minimum (L50) life in excess of 200,000 hours at maximum cataloged operating speed. Motors and drives shall be mounted out of the airstream.

For belt drive units, drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be of the fully machined cast iron type, keyed and securely attached to the wheel and motor shafts. Motor pulleys shall be adjustable for final system balancing.

A NEMA 1 disconnect switch shall be provided. Factory wiring shall be provided from motor to the handy box.

All fans shall bear the AMCA Certified Ratings Seal for both sound and air performance.

Each fan shall bear a permanently affixed manufacturer's nameplate containing the model number and individual serial number for future identification.

For exhaust applications, provide a back draft damper.

Square Centrifugal In-Line Fans shall be Penn, Cook, Carnes, Greenheck, Twin City Fan, Aerovent, PennBarry, S&P, ACME, or equal.

1.10 CEILING/IN-LINE EXHAUST FANS:

Furnish and install ceiling and in-line exhausters where shown on the Drawings. Units shall be complete with centrifugal fans, rubber mounted motor, insulated steel housing, eggcrate aluminum grille, and backdraft damper. Motor shall be 115 volt, single phase with integral motor overload protection.

Fan capacity shall be as listed in the schedule on the Drawings.

Fan RPM shall not exceed 1200 RPM.

Ceiling Exhaust Fans shall be Penn, Pace, Cook, Carnes, Greenheck, Twin City Fan. Aerovent, PennBarry, ACME, or equal.

1.11 MANUAL DAMPERS:

Furnish and install splitter dampers and balancing dampers in the ductwork where shown and wherever required to accurately balance the system. Splitter dampers shall be minimum of 20 gauge, rigid to prevent vibration and held securely in place at any setting with heavy lock quadrant.

Balancing dampers in rectangular ductwork shall be Ruskin Model No. MD-35 or equal complete with rigid frame, 16 gauge galvanized steel blades, 8 inch maximum blade width, synthetic bearings and heavy lock quadrant with position indicator.

Manual dampers at branch duct tees shall have integral spin-in fittings. Branch duct dampers and tees of equal or greater size to the main duct shall have an integral shoe type fitting. Balancing dampers shown in round ductwork shall be heavy gauge with a locking quadrant on one side and a shaft extending through the other side of the duct. Manual dampers with integral takeoff fittings shall be as manufactured by Cardinal Supply, Sheet Metal Connectors, Inc. or equal.

Manual Balancing Dampers shall be Ruskin, Greenheck, Air Balance, Cesco, Pottorff or equal.

1.12 LOUVERS:

Furnish and install Ruskin Model ELF6375DX or equal louvers where shown on the Drawings. Louvers shall be stationary drainable type with a drain gutter in each blade and downspouts in jambs and mullions. Blades shall be contained within a single 6" frame. Louver construction shall be 0.080 inch thick 6063 extruded aluminum alloy frame with integral caulking slots. Blades shall be 0.080 inch thick 6063 extruded aluminum alloy at 37-1/2 degree angle on approximately 6 inch centers. A birdscreen shall be contained within a removable frame. Provide an extended sill with end dams.

Louver components (heads, jambs, sills, blades, and mullions) shall be factory assembled by louver manufacturer. Louver sizes too large for shipping shall be built up by contractor from factory assembled louver sections to provide overall size required.

Louver shall be finished with baked acrylic enamel in color selected by the Architect, from a standard color chart.

Louver pressure drop shall not exceed the values shown on the Drawings and shall bear the AMCA seal. All ratings shall be in accordance with AMCA Standard 500 and shall include the effect of the bird screen.

Louvers shall be Airolite, American Warming and Ventilating, Inc., Carnes, Louvers and Dampers, Inc., Arrow, United, Cesco, Ruskin, Dowco, Industrial Louvers, Greenheck, Pottorff, Construction Specialties, NCA, Nailor, or equal.

1.13 GAS VENT AND FLUE PIPING:

Gas vent piping from a point 2'-0" below ceilings shall be Metalbestos RV, Type "B" double wall gas vent piping or equal, Underwriter's Laboratories approved, gas vent pipe in sizes shown on the Drawings. Vent shall be extended a minimum of 24 inches above the roof, or as indicated on the Drawings. Furnish and install round birdproof tops, storm collar, flashing cone and accessories as necessary for an approved installation.

Gas vent piping 10 inches and larger, when required, shall be Metalbestos QC, Type "B", vent pipe, otherwise similar to above.

Flue piping shown between appliances and gas vent pipe shall be standard weight galvanized steel with standard fittings tightly fitted and properly pitched. Maintain 1 inch clearance (minimum) to combustibles.

Gas Vent Piping shall be Metalbestos, Stacks Inc., Metal-Fab, Van Packer, AMPCO-Amerivent or equal.

1.14 TEMPERATURE CONTROL:

The Contractor shall furnish and install all dampers, damper operators, thermostats, and all related components as shown on the Drawings and as required for a complete temperature control system. The system shall be electric or electronic as manufactured by Siemens, Johnson Controls, Ivensy, Trane, Alerton, Staefa, CSI, KMC, Honeywell or equal.

All wall mounted sensors/thermostats shall be roughed in using a standard electrical box with conduit in the wall extended to the accessible ceiling area. They shall be mounted in accordance with and at a height to comply with The American's With Disabilities Act (ADA), unless noted otherwise on the Drawings. Mounting sensors with anchors or toggle bolts is not permitted.

The components shall be single temperature as required under sequence of operation and shall be located as shown on the Drawings.

Control Dampers:

Rectangular control dampers shall be Ruskin Model No. RCD46/CD356 or equal and have 16 gauge galvanized steel blades with integral structural reinforcing running full length of the blade. The frame shall consist of 16 gauge galvanized steel. There shall be no blade over 8 inches in width, 48 inches in length, without support, and all damper bearings shall be synthetic type. Blade edge seals shall be PVC coated polyester fabric suitable for -25°F to 180°F mechanically locked into the blade edge and jamb seals shall be of the flexible metal compression type. Dampers shall be AMCA certified for leakage not greater than 6 cfm per square foot at a 4 inch w.g. pressure differential (24 inch wide). Modulating dampers shall be opposed blade.

Round control dampers shall be of the butterfly type consisting of a circular blade mounted to a shaft. Inside frame surface shall be clean and smooth with no blade stops or similar inward projections. Frames shall include rolled stiffener beads to allow easy sealing of spiral ductwork joints. Dampers shall include a firm, closed-cell neoprene seal sandwiched between two blades. Leakage through the damper in the closed position shall

not exceed 0.15 cfm per inch of blade circumference at a pressure differential of 4" w.g. Leakage through the bearings shall be less than 0.25 cfm at 4" static pressure. Damper frame and blade shall be fabricated from galvanized steel. All parts not protected shall be given one coat of aluminum paint.

Damper Actuators:

Damper actuators shall each be sized to operate dampers with sufficient reserve power to provide smooth modulating action or 2-position action as specified.

Actuators shall be 115 volt or 24 volt, single phase, as required by the Sequence of Operation.

On-off spring return damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall have a manual positioning mechanism accessible on its cover. Actuators shall use a brushless DC motor and be protected from overload at all angles of rotation. Run time shall be constant and independent of torque. If required, 2 SPDT auxiliary switches shall be provided with one switch having the capability of being adjustable. Actuators with switches shall be constructed so an electrical ground connection is not required to meet agency listings. Actuators shall be UL listed and CSA certified, have a 2 year warranty, and be manufactured under ISO 9001 International Quality Control Standards.

Damper Actuators shall be Belimo or equal.

Thermostat Guards:

Where shown on the Drawings or in vestibules, corridors, toilet rooms or other unsupervised areas, provide sturdy (wire or cast aluminum) thermostat guards. Provide guards with a substantial base plate firmly anchored to the wall. Thermostat access shall be by tamperproof screws or keyed lock.

Recessed sensors with flush wall cover plate (flat plate) sensors may be provided in lieu of sensor/thermostat guards.

The manufacturer of the control components used shall submit Shop Drawings of all equipment components used with complete wiring diagrams of all control wiring.

Sequence of Operation:

EF-1: Activate upon CO-NO2 alarm.

EF-2/EF-3/EF-4/SF-1: Shall run continuously based on occupied schedule set by time clock provided by electrical contractor.

Furnace: Provide a four hour remote wall occupied-unoccupied timer switch adjacent to each furnace thermostat to activate the occupied mode for 0-4 hours. Furnace fan shall operate continuously during the occupied mode with the outdoor air damper open. Furnace fan shall

cycle on call for heating or cooling during the unoccupied mode with the outdoor air damper closed.

UH-1/UH-2: Shall activate upon a call for heat by the remote thermostat.

ERV-1: Shall run continuously based on occupied schedule set by time clock provided by electrical contractor. Fan speeds shall be modulated based on a differential pressure sensor in the supply air duct.

1.15 OUTSIDE AIR DAMPER:

Automatic control dampers shall be Ruskin Model No. RCD46/CD356, Cesco, Greenheck or equal and have 16 gauge galvanized steel blades with integral structural reinforcing running full length of the blade. The frame shall consist of 16 gauge galvanized steel. There shall be no blade over 8 inches in width, 48 inches in length, without support, and all damper bearings shall be synthetic type. Blade edge seals shall be EPDM rubber or PVC coated polyester fabric suitable for -25°F to 180°F mechanically locked into the blade edge and jamb seals shall be of the flexible metal compression type. Dampers shall be AMCA certified for leakage not greater than 6 cfm per square foot at a 4 inch w.g. pressure differential (24 inch wide). Modulating dampers shall be opposed blade.

1.16 DAMPER ACTUATORS:

Size each actuator to operate dampers with sufficient reserve power to provide smooth modulating action or 2-position action as specified.

Actuators shall be 115 volt or 24 volt, single phase, as required by the Sequence of Operation.

On-off spring return damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall have a manual positioning mechanism accessible on its cover. DC motors shall be brushless and be protected from overload at all angles of rotation. Run time shall be constant and independent of torque. If required, 2 SPDT auxiliary switches shall be provided with one switch having the capability of being adjustable. Actuators with switches shall be constructed so an electrical ground connection is not required to meet agency listings. Actuators shall be UL listed and CSA certified, have a 2 year warranty, and be manufactured under ISO 9001 International Quality Control Standards.

Furnish spring return actuators for dampers. Dampers larger than 25 sq.ft. shall be equipped with two damper motors. Size spring-return motors for running torque rating of 133 inch-pounds.

Damper Actuators shall be Belimo or equal.

1.17 TESTS:

General:

The following tests shall be performed on the respective systems. Tests shall be repeated until each system is proven acceptable.

Ventilation and Air Conditioning:

The Contractor shall make thorough tests of the following systems.

Air Systems:

The Contractor shall make a thorough test of all air systems. He shall properly balance the air flow to and from all openings and make any adjustments necessary in fan speeds, etc., to meet the required air volume.

The Contractor shall furnish to the Architect/Engineer one electronic typewritten copy of tabulations of the air volumes. This tabulation shall include unit number, room number, supply, return, or exhaust

CFM's for all openings, showing both required CFM and calculated CFM, grille size. The Contractor shall also submit a tabulation of all fan RPM's, static pressure, CFM's and fan motor current and voltage readings taken after the terminals have been balanced.

END OF SECTION 230800

SECTION 260100 – COMMON ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. In certain instances where the terms of this Division of the Specifications conflict with the terms of the General Conditions, or Special Conditions, this Division of the Specifications shall govern.

B. Note that the complete electrical installation for this project falls under three specification divisions: Division 26, Division 27, and Division 28.

C. The project shall be bid as one complete package with the final electrical construction bid containing all costs for Divisions 26, 27, and 28.

D. The general requirements shown here in this Division 26 section shall also apply to Divisions 27 and 28.

E. Where M.C. or Mechanical Contractor is referenced in Division 26, 27, or 28 specifications or on the electrical drawings, it refers to the general trade. Coordinate in field with the proper Fire Suppression, Plumbing, or HVAC Contractor based on the information in the specification or note.

1.2 SUMMARY

A. This Section shall include everything in Divisions 26, 27, and 28 of the Specifications and everything indicated on the Drawings that are complementary to these Divisions of the Specifications. Refer to the Index of Drawings to determine what Drawings apply directly to this section.

B. Where “Contractor” is referred to in this Division of the Specifications it shall mean Contractor and/or Sub-Contractors responsible for all or any part of the electrical installation specified in Divisions 26, 27, and 28 and/or as shown on the Contract Drawings.

C. Where the specifications in subsequent Sections of Divisions 26, 27, or 28 conflict with requirements of this Section, the specifications in the subsequent Sections shall govern.

D. The contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled on the Drawings and/or herein specified, including all labor, materials, equipment, accessories, wiring, and incidents necessary to be installed in accordance with manufacturer’s recommendations except as otherwise approved.

1.3 INTENT OF PLANS AND SPECIFICATIONS

A. The intent of the plans and specifications are for the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the owner complete and ready for safe and efficient operation. The plans and specifications cannot deal individually with the many incidental items which may be required by the nature of the systems. The contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly in the drawings and specifications are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.

B. The contractor shall make a thorough inspection of the conditions and be familiar with all conditions affecting the extent and cost of this work. Claims for extra payments as a result to examine the conditions will not be allowed.

1.4 PERMITS AND SERVICE CHARGES

A. All permits and service charges necessary for execution of the work under this Contract shall be obtained by and be paid for by the Contractor. It shall be the responsibility of the Contractor to determine the permit requirements of the local authorities and utility companies and the cost of required permits, service charges, tap fees and development fees shall be included in the Contractor's bid.

B. All work shall be executed in accordance with all local, state, and national rules, regulations, codes, etc., which are applicable and shall be subject to inspection by the proper authorities.

1.5 CODES AND STANDARDS

A. All work performed and all equipment furnished under this Division of the Contract shall be manufactured and installed in strict accordance with all applicable codes and standards, including the applicable provisions of the following codes and standards.

1. Local and State Codes, Standards, and Regulations.
2. NFPA 70, National Electrical Code, Current Addition.
3. National Board of Fire Underwriters (NBFU).
4. National Electrical Manufacturers Association (NEMA).
5. Underwriters Laboratories (UL).
6. Electrical Testing Laboratory (ETL).
7. Illuminating Engineering Society (IES).
8. American National Standards Institute (ANSI).
9. National Fire Protection Association (NFPA).
10. International Building Code (IBC).
11. International Fire Code (IFC).

B. Compliance:

1. Where specific requirements of any code vary with the requirements of another code, the higher standard as determined by the Architect/Engineer shall govern the installation. Contractors shall familiarize themselves with local codes and regulations which affect their work in any way. Extra payment will not be allowed for changes required by local codes and regulations.
2. All equipment manufactured in accordance with the provisions of the above codes and standards shall bear the label of the respective association bureau thereon.

1.6 DRAWINGS AND MEASUREMENTS

A. In general, the Drawings of the electrical systems and equipment are to scale. However, to determine exact locations of walls and partitions, the Contractor shall consult the architectural and/or structural drawings which are dimensioned. Drawings shall not take precedence over field measurements.

B. Drawings of fixtures and devices, although shown on scale drawings, are diagrammatic only. They are intended to indicate size and/or capacity where stipulated, approximate location and/or direction, and approximate general arrangement of one phase of work to another, but not the exact detail or exact arrangement of construction. If it is found, before installation of any or all construction phases, that a more convenient, suitable or workable arrangement of any or all phases of the project would result by varying or altering the arrangement indicated on the Drawings, the Architect/Engineer may require the Contractor to change the location or arrangement of the work without additional cost to the Owner. Such rearrangement shall be in accordance with directions from the Architect/Engineer.

1. Install light fixtures and wiring devices at heights specified in the Electrical Symbol Legend or as shown on the drawings. All measurements are to center unless noted otherwise. Device heights indicated on architectural elevations shall take precedence over symbol legend.

C. Where discrepancies are discovered after certain portions or phases of the work have been installed, the Architect/Engineer reserves the right to require the Contractor to make changes in conduit, fixture or equipment locations or arrangements to avoid conflicts with work at no additional cost to the Owner.

D. Because the Drawings are to a relatively small scale to show as large a portion as is practical, the fact that only certain features of the systems are indicated does not mean that other similar or different features or details will not be required. The Contractor shall furnish all incidental labor, material or equipment for the systems so that each system is a complete and operating one unless otherwise specifically stipulated in the detailed body of the specifications.

E. The Contractor, Subcontractor's and their respective trades shall cooperate in laying out their work so it will fit properly into the space provided. Promptly report to the Architect/Engineer any delay or difficulties encountered in the installation of this work which might prevent prompt and proper installation, or make it unsuitable to connect with or receive the work of others. Failure to so report shall constitute an acceptance of the work of other trades as being fit and proper for the execution of this work.

1.7 SUBSTITUTIONS AND PRODUCT OPTIONS

A. The Contractor and equipment suppliers shall read and familiarize themselves with articles concerning substitution of materials, as indicated in the Instructions to Bidders. Material and equipment substitutions will be handled as follows:

B. Materials or equipment specified by name of manufacturer, brand, trade name or catalog reference, shall be furnished under the contract unless changed by Addenda or a Contract modification. Where two (2) or more materials are named, the choice of these shall be optional with the Contractor.

C. Material or equipment followed by the phrase "or equal" shall establish a standard of required function, dimension, appearance and quality to be met by any proposed substitute. No substitution will be considered unless written request for substitution has been submitted by the bidder and has been received by the Architect/Engineer at least seven days prior to the date for receipt of bids. The Architect/Engineer's decision on a proposed substitute shall be final. If the Architect/Engineer considers any proposed substitution equal, such will be set forth in an Addendum. Bidders shall not rely upon substitutions made in any other manner.

D. Whenever an item of material or equipment is identified on the drawings or specifications by reference to brand name or catalog number, it shall be understood that the reference is made for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality, or function may be considered.

E. The listing of any manufacturer preceded by the phrase “or equal by” does not imply automatic approval. It is the sole responsibility of the Contractor to ensure that any price quotations received and submittals made are for products which meet or exceed the specifications included herein. The Contractor must judge that such items of substitution are of equal quality and character to the specified items and it is physically adaptable for installation within the allotted space with all required service clearances. The cost of any changes to other trades as a result of use of the substitution material or equipment must be borne by the Contractor submitting such material or equipment.

F. Should the Contractor wish to use materials or equipment other than those specified or listed as equal by Addenda, he shall attach his proposed substitution along with full descriptive and technical data for the proposed item with the appropriate add or deduct to the Contract amount, should the substitution be accepted. Substitutions proposed by the Contractor will not be considered in the award of the Contract.

G. After the award of the Contract, any request for a substitution must be made in writing by the Contractor (not the material supplier or subcontractor). Such request shall state the name of the product specified, the name of the product proposed for substitution, the reason for requesting the substitution, and any change to the Contract amount resulting from the substitution. No such substitution shall be made until an appropriate Contract modification has been issued and approved.

1.8 SUBMITTALS

A. Schedule of Materials and Equipment:

1. The Contractor shall submit a complete list of proposed equipment manufacturers for major systems and a list of Sub-Contractors, for the Engineer’s review. This list shall be submitted for review within 15 days after the contract award and before ordering any material or equipment.

a. Review of the list shall in no way relieve the Contractor from the responsibility of submitting complete shop drawings nor shall it constitute approval should the shop drawings be found to be partially or completely not in full compliance with the specification requirements.

B. Schedule of Values:

1. The Contractor shall submit an itemized schedule of values for the various portions of the work, including separation of labor and materials for each item, to the Engineer before submission of the first Request for Payment. The schedule of values shall be divided so as to facilitate the Engineer’s analysis of the various costs for the purpose of approval of the payment requests. The submittal shall meet the approval of the Engineer before any progress payment will be provided. The following are required categories for the cost breakdown.

a. Service and Distribution Equipment.

b. Packaged Engine Generator and Transfer Switch

c. Lighting & Lighting Control

d. Wiring Devices.

e. Equipment Connections.

f. Basic Materials.

g. Special Systems.

C. Shop Drawings:

1. Refer to the requirements of the General Conditions. Submit to the Architect/Engineer copies of Shop Drawings for each item listed in the Submittal paragraphs of these specifications. Furnish additional Shop Drawings as required for coordination with General Contractor and other Subcontractors. Furnish Shop Drawings as follows:

   a. For all major items of equipment or materials, regardless of whether the item is to be furnished as specified.

   b. For all equipment, systems or devices where Shop Drawings are specifically called for.

   c. For all minor items of equipment or materials where the Contractor proposes to deviate from the specified and/or scheduled manufacturer or material.

   d. Shop drawings shall include manufacturer, catalog number, voltage and current characteristics, wire sizes, construction, and rough-in data of all materials to be used. Each product data sheet shall clearly indicate the proposed product.

   e. Major components of Divisions 26, 27, and 28 shall be submitted at one time. All such literature shall be bound in amply sized three-ring binders with table of contents and tabbed sections separating and identifying the sections of the shop drawings. Tabbed sections shall correspond with Divisions 26, 27, and 28 specification sections.

2. The Contractor shall check all Shop Drawing submittals for compliance with Contract Documents, for size, capacity, arrangement, connection locations, materials, finish, color, electrical characteristics, accessories, and shall so note the Shop Drawings prior to submittal to the Architect/Engineer. Any deviation from the Drawings and Specifications shall be indicated.

   a. Each shop drawing shall be certified as being checked and approved by the Contractor before submittal. Shop drawings not indicated as being approved by the Contractor will be returned without review.

3. Shop Drawings will be reviewed by the Architect/Engineer, and copies of Shop Drawings will be returned to the Contractor. Shop Drawings shall be submitted sufficiently in advance of the construction schedule to allow time for checking Drawings, resubmittal and rechecking when necessary.

4. Any equipment or material which is installed without authorization by properly processed Shop Drawings will be subject to removal by the Contractor and reinstallation as directed, without cost to the Owner. All cost for repair for damages as may be incurred to the structure as a result of the above correction shall be paid by this Contractor.

5. Shop drawing material quantities will not be checked by the Architect/Engineer, and review of Shop Drawings by the Architect/Engineer shall not be construed to be verification of the material quantities and sizes shown on the Shop Drawings. Quantities, sizes, dimensions and locations shown on the Drawings and as specified shall determine material requirements.

6. The Contractor shall maintain two (2) copies of approved shop drawings to be submitted with the Operating and Maintenance Manuals.

1.9 QUALITY ASSURANCE

A. Materials and equipment shall be new and of the best quality, of the type best suited for the purpose intended, and be made by nationally recognized and substantially established manufacturers. The type and weight of material used for each purpose shall be as herein specified, and material shall conform to the requirements of the latest standard specifications of the “ASTM” for that particular material.

B. All materials and equipment shall be listed, labeled, or certified by a nationally recognized testing laboratory to meet Underwriters Laboratories, Inc., standards where test standards have been established.

1. Equipment and materials which are not covered by UL Standards will be accepted provided equipment and material is listed, labeled, certified, or otherwise determined to meet safety requirements of a nationally recognized testing laboratory.

2. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as NEMA, or ANSI. Evidence of compliance shall include certified test reports and definitive shop drawings.

C. The installation work included in this specification shall be performed in a neat workmanlike manner by persons experienced and skilled in the Electrical trade. Only the best quality workmanship will be accepted. All exposed parts of the electrical wiring systems such as exposed conduits, flush plates, cabinet trims, fixtures, etc., shall be square and true with the building construction.

1.10 COORDINATION OF WORK

A. The Mechanical and Electrical Contractors and their Subcontractors shall have coordination meetings to facilitate the installation of equipment, ducts, pipes, electrical panels and equipment, and other miscellaneous equipment. The Mechanical Contractor and Electrical Contractor shall coordinate the location of all equipment during the coordination meetings to prevent interferences between equipment of different systems. Any conflicts that may be discovered during the coordination meetings shall be brought to the immediate attention of the Engineer.

B. The Contractor shall order equipment and materials in a timely manner and shall be responsible for close correlation of the work with that of all other Contractors on this project so that it will not interfere with or delay the work of other Contractors. The Contractor shall confer and cooperate with all other Contractors on this project and shall arrange the work in proper relation to the work of others.

1.11 RECORD DRAWINGS AND OPERATING AND MAINTENANCE MANUALS

A. Record Drawings:

1. The Contractor shall keep a complete set of all electrical drawings in the jobsite office for purpose of showing the installation of electrical systems and equipment. This set of drawings shall be used for no other purpose. Where any materials equipment or system components are installed different from that shown on the Architect/Engineer's drawings, such differences shall be clearly and neatly shown on this set of drawings using ink or indelible pencil. At the completion of the project, the record set of drawings shall be turned over to the Architect/Engineer and shall become his property.

a. Incorporate all changes made by addendum, shop drawing review, change order, and field orders.

B. Operating and Maintenance Manuals:

1. The Contractor shall furnish the Owner with two (2) sets of complete catalog data (approved shop drawings), manufacturer’s literature and detailed manuals covering the operation and maintenance of all equipment specified under this Division.

a. Comply with Division 1 requirements.

b. The manual shall indicate the Contractor's name, address, and phone number and include a list of all Subcontractors, including company name, address, and telephone number.

c. The manual shall include, but not be limited to, the following: Installation instructions; maintenance and overhaul instructions; procedures for start, operation, and shut down of equipment and systems; complete wiring and control diagrams; cleaning of lighting fixtures lenses and other equipment; safety precautions; diagrams and illustrations; manufacturers' name and catalog data; test procedures; name and address of authorized service organizations; and parts distributor for all material and equipment installed. Include all special warranty statements for all special warranties required by contract documents.

d. The manual shall include a complete inventory list of all extra materials which are specified to be provided in the Contract.

e. All such literature shall be bound in an amply sized three-ring binder with table of contents and tabbed sections separating and identifying the sections of the manual.

2. The Contractor shall supervise the initial operation of all equipment and instruct the Owner's designated operator or maintenance representative in such operation as to acquaint the operator thoroughly with the equipment.

C. Testing:

1. Work which is required to be placed within the construction or concealed shall be carefully tested and inspected before being permanently concealed.

2. The Contractor shall provide all testing instruments, equipment, and all materials, connections, labor, etc., required to perform tests.

3. Test all circuits, fixtures, equipment, and systems for proper operation and freedom from grounds, shorts, and open circuits before acceptance is requested.

4. Provide complete operational sequence checkout to verify all modes of operation both normal and alarm for each system. Test all control systems that interact with each other as a complete system to demonstrate that all interconnections and interactions are correct and that all interconnect wiring is functional.

5. Perform all tests required by local authorities, such as tests of life safety systems, in addition to tests specified herein. Perform tests required by other specification sections.

6. Tests shall be made in the presence of the Engineer and the Owner, and shall meet with their approval. The Contractor shall notify the Engineer at a time sufficiently prior to the performance of any test to allow time for the engineer to be present for the test.

7. The entire system shall be subject to a test at full operating and under normal usage conditions. This shall include voltage and current checks, resistance measurements, and equipment operation. Failure of any phase of system operation shall constitute failure of the system. Correct failures and retest system. Repeat until the system is operating to required specifications.

a. Submit dated "Electrical System Test Reports" indicating all tests performed and demonstrating conformance with the required system performance criteria in tabular form.

8. After testing the apparatus, the entire system shall be operated for one week under normal conditions.

9. The final testing shall be performed as soon as possible after the work is entirely completed.

1.12 FINAL INSPECTION

A. Upon completion of the work, the Contractor shall notify the Architect and/or Engineer and make arrangements for a final inspection. The Contractor shall submit the operation and maintenance manuals prior to the final inspection; the Engineer will not schedule nor perform a final inspection without successful submittal of operating and maintenance manuals by the Contractor.

1. During the final inspection and subsequent follow-up final inspection, the Contractor and all major Sub-Contractors shall have the foreman of the project present.

B. After the Engineer's final inspection is made, the Contractor will receive a list of items requiring adjustment, correction, replacement, or completion.

C. The Contractor shall comply completely with all the listed requirements within thirty (30) days of receipt of the list. Should the Contractor fail to perform within this time limit, the Owner reserves the right to have the work completed by others and the cost deducted from the contract price.

D. The Contractor shall notify the Architect and/or Engineer once all listed requirements are completed, that the Contractor is ready for a follow-up final inspection. The written notice shall contain explanations for those known items not completed and a schedule for completing them.

E. The Architect and/or Engineer shall schedule a follow-up final inspection to confirm completion of all listed requirements. Repeated inspection trips required of the Engineer due to the Contractor's inability to complete the project satisfactorily will require the Contractor to reimburse the engineer for all incurred costs after the follow-up final inspection.

1.13 GUARANTEE

A. The Contractor shall assume responsibility for any defects which may develop in any part of his work caused by faulty workmanship, material or equipment, and agrees to replace, repair, or alter, at the Contractors expense, any such faulty workmanship, material, or equipment that has been brought to the Contractors attention during a period of one year from the date of the final certificate for payment. Acceptance of the work shall not waive this guarantee.

1. Refer to Divisions 26, 27, and 28 Specifications for additional special equipment warranties.

END OF SECTION 260100

SECTION 260500 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. In certain instances where the terms of this Division of the Specifications conflict with the terms of the General Conditions, or Special Conditions, this Division of the Specifications shall govern.

1.2 SUMMARY

A. This Section includes the following:

1. Supporting devices for electrical components.
2. Electrical identification.
3. Electricity-metering components.
4. Concrete equipment bases.
5. Firestopping
6. Cutting and patching for electrical construction.
7. Touchup painting.

1.3 SUBMITTALS

A. Product Data: Include manufacturer product data sheets for underground warning tape, electric metering equipment, and firestopping materials to be utilized on this project.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.

1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the work. Coordinate installing large equipment requiring positioning before closing in the building.

C. Coordinate electrical service connections to components furnished by utility companies and the owner.

1. Coordinate installation and connection of exterior underground utilities and services, including provision for electricity-metering components.

2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.

D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Division 8 Section "Access Doors."

E. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

F. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

PART 2 - PRODUCTS

2.1 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- (14-mm-) diameter slotted holes at a maximum of 2 inches (50 mm) o.c., in webs.

1. Channel Thickness: Selected to suit structural loading.

2. Fittings and Accessories: Products of the same manufacturer as channel supports.

D. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers. Wire hangers shall not be utilized for supporting raceway or boxes (except for supporting raceways installed within steel stud walls where raceways are supported from the studs).

E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

F. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

G. Expansion Anchors: Carbon-steel wedge or sleeve type.

H. Toggle Bolts: All-steel springhead type.

2.2 ELECTRICAL IDENTIFICATION

A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.

B. Colored Adhesive Marking Tape for Raceways: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick (25 mm wide by 0.08 mm thick).

C. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:

1. Not less than 6 inches wide by 4 mils thick (150 mm wide by 0.102 mm thick).
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend that indicates type of underground line.

D. Tape Markers for Wire and Cables: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

E. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

F. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background.

G. Interior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Preprinted, aluminum, baked-enamel-finish signs, punched or drilled for mechanical fasteners, with colors, legend, and size appropriate to the application.

H. Exterior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm), galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch (6-mm) grommets in corners for mounting.

I. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

2.3 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING

A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.

2.4 CONCRETE BASES

A. Concrete Forms and Reinforcement Materials: As specified in Division 3 Section "Cast-in-Place Concrete."

B. Concrete: 3000-psi (20.7-MPa), 28-day compressive strength as specified in Division 3 Section "Cast-in-Place Concrete."

2.5 FIRESTOPPING

A. Conduit, cable penetrations, and any other electrical equipment penetrations of fire rated construction, equipment rooms, and/or where designated on the Drawings shall be sealed with a fire retardant sealant similar to:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant.
2. STI SpecSeal Series LCI Intumescent Sealant.
3. STI SpecSeal Series SST Firestop Putty.
4. STI SpecSeal Series SSB Firestop Pillows.
5. STI Pensil 200 Silicone Foam.
6. STI EZ-PATH Fire Rated Pathway.

B. Fire sealants shall be Specified Technologies, Inc., 3M Fire Protection Products, A/D Fire Protection Systems, Inc., Nelson Firestop Products, or equal.

1. Firestopping materials shall be low VOC.

C. Obtain through-penetration firestop systems from a single manufacturer with experienced installers having the necessary experience, staff, and training to install manufacturer's products per project requirements.

2.6 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

A. The installation shall be in accordance with the latest requirements of the NEC, State, and Local Codes, ordinances and regulations of any other governing body having jurisdiction

B. All equipment shall be installed in a neat and workmanlike manner and to the satisfaction of the Project Engineer.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.

D. Equipment Rooms: Line walls where electrical equipment is to be mounted with ¾" plywood backboards. Paint backboards with two coats of low VOC gray fire retardant paint.

1. Where equipment is installed in rooms being used as return air plenums, electrical equipment shall be mounted to Hoover Treated Wood Products Pyro-Guard backboards.

E. Mount panelboards, contactors, and other electrical equipment on backboards, unless otherwise indicated.

F. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

G. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

H. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.

B. Dry Locations: Steel materials.

C. Support Clamps for PVC Raceways: Click-type clamp system.

D. Selection of Supports: Comply with manufacturer's written instructions.

E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb (90-kg) design load.

3.3 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

1. Wire hangers are not an acceptable support component for supporting raceways and boxes (except for supporting raceways installed within steel stud walls where raceways are supported from the studs).

2. Nothing shall rest on, or depend for support on, suspended ceilings (tiles, lath, plaster, as well as splines, runners, bars, and the like in the plane of the ceiling).

3. Support raceways at intervals no greater than ten feet and with one support within three feet of each coupling, box, fitting, or outlet box. Provide one support within three feet of each elbow or bend.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch- (6-mm-) diameter or larger threaded steel hanger rods, unless otherwise indicated.

G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch (38-mm) and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Simultaneously install vertical conductor supports with conductors.

J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches (610 mm) from the box.

K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

M. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:

1. Wood: Fasten with wood screws or screw-type nails.
2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
3. New Concrete: Concrete inserts with machine screws and bolts.
4. Existing Concrete: Expansion bolts.
5. Steel: Welded threaded studs or spring-tension clamps on steel.
    a. Field Welding: Comply with AWS D1.1.
6. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
7. Light Steel: Sheet-metal screws.
8. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.4 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

C. Self-Adhesive Identification Products: Clean surfaces before applying. Self adhesive identification products are not approved for electrical equipment enclosure labels.

D. Tag and label circuits. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification. Neatly mark junction box covers with voltage, source and circuit numbers with permanent black marker.

1. Feeder and Power Circuit Identification: Use plasticized card stock for cables, feeders, and power circuits in pull boxes and electrical rooms.
    a. Legend: ¼” steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.

b. Fasten tags with nylon cable ties, fasten bands using integral ears.

2. Apply identification to conductors as follows:

a. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color coding for voltage and phase indication of secondary circuit.

b. Multiple Control or Communications Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color coding, or cable marking type.

E. Equipment Identification: Apply equipment identification labels of engraved plastic laminate on each major piece of equipment. This includes communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Provide labels for the following types of equipment.

1. Switchboards, distribution panels, panelboards, and electrical enclosures.

2. Access doors and panels for concealed electrical items.

3. Enclosed controllers, indicate which motor or piece of equipment the unit is serving.

4. Enclosed switches and circuit breakers, indicate which motor or piece of equipment the unit is serving.

5. Service Equipment: Service equipment in other than dwelling units shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault current calculation was performed.

6. Lighting control panels and contactors.

7. Transformers.

8. Fire alarm control panel.

9. Paging Intercom and Sound system equipment racks.

F. Install continuous underground warning tape during trench backfilling, for exterior underground power, control, signal, and communication lines, locate marker directly above power and communication lines. Locate approximately 8 inches below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches (400 mm), overall, use a single line marker.

G. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:

1. Phase A: Black.

2. Phase B: Red.

3. Phase C: Blue.

H. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

I. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

3.5 UTILITY COMPANY ELECTRICITY-METERING EQUIPMENT

A. Install equipment according to utility company's written requirements. Provide grounding and empty conduits as required by utility company.

3.6 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 2 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."

B. The Electrical Contractor shall size and provide the concrete and installation associated with the following items as called out elsewhere in the plans and specifications:

1. Utility Transformer and CT Cabinet Pads.
2. Packaged Engine Generator Pad.
3. Light Pole Bases.
4. Exterior Grade Mounted Light Fixtures.

C. Provide “house keeping pads” for all floor mounted electrical components, including transformers, switchboards, distribution boards, and motor controls centers. Pads shall be a minimum of 4” thick and comply with parts 2 and 3 of this specification section.

3.7 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly.

3.8 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.9 FIELD QUALITY CONTROL

A. Inspect installed components for damage and faulty work, including the following:

1. Supporting devices for electrical components.
2. Electrical identification.
3. Electricity-metering components.
4. Concrete bases.
5. Firestopping materials.
6. Cutting and patching for electrical construction.
7. Touchup painting.

3.10 REFINISHING AND TOUCHUP PAINTING

A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting."

1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.11 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 260500

SECTION 260573 – ARC FLASH HAZARD ANALYSIS/SHORT-CIRCUIT/COORDINATION STUDY

PART 1 GENERAL

1.01 SCOPE

A. The contractor shall furnish short-circuit and protective device coordination studies as prepared by a Professional Engineer.

B. The contractor shall furnish an Arc Flash Hazard Analysis Study per the requirements set forth in the current version of NFPA 70E -*Standard for Electrical Safety in the Workplace*. The arc flash hazard analysis shall be performed according to the IEEE Standard 1584 – 2002, the IEEE *Guide for Performing Arc-Flash Calculations.*

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract.

1.03 REFERENCES

A. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

1. IEEE 141 – Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems
2. IEEE 242 – Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
3. IEEE 399 – Recommended Practice for Industrial and Commercial Power System Analysis
4. IEEE 241 – Recommended Practice for Electric Power Systems in Commercial Buildings
5. IEEE 1015 – Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
6. IEEE 1584 -Guide for Performing Arc-Flash Hazard Calculations

B. American National Standards Institute (ANSI):

1. ANSI C57.12.00 – Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
2. ANSI C37.13 – Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures
3. ANSI C37.010 – Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
4. ANSI C 37.41 – Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.

C. The National Fire Protection Association (NFPA)

1. NFPA 70 -National Electrical Code, latest edition
2. NFPA 70E – Standard for Electrical Safety in the Workplace

1.04 SUBMITTALS FOR REVIEW/APPROVAL

A. The studies shall be submitted to the design engineer prior to receiving final approval of the

distribution equipment shop drawings and/or prior to release of equipment drawings for manufacturing. If formal completion of the study may cause delays in equipment shipments, approval from the Engineer may be obtained for a preliminary submittal of data to ensure that the selection of device ratings and characteristics will be satisfactory to properly select the distribution equipment. The formal study will be provided to verify preliminary findings.

1.05 SUBMITTALS FOR CONSTRUCTION

A. The results of the short-circuit, protective device coordination and arc flash hazard analysis studies shall be summarized in a final report. Electronic PDF copies of the report shall be provided. A minimum of three (3) bound copies of the complete final report shall also be submitted.

B. The report shall include the following sections:

1. Executive Summary including Introduction, Scope of Work and Results/Recommendations.
2. Short-Circuit Methodology Analysis Results and Recommendations
3. Short-Circuit Device Evaluation Table
4. Protective Device Coordination Methodology Analysis Results and Recommendations
5. Protective Device Settings Table
6. Time-Current Coordination Graphs and Recommendations
7. Arc Flash Hazard Methodology Analysis Results and Recommendations including the details of the incident energy and flash protection boundary calculations, along with Arc Flash boundary distances, working distances, Incident Energy levels and Personal Protection Equipment levels.
8. Arc Flash Labeling section showing types of labels to be provided. Section will contain descriptive information as well as typical label images.
9. One-line system diagram that shall be computer generated and will clearly identify individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location, device numbers used in the time-current coordination analysis, and other information pertinent to the computer analysis.
10. Mechanical equipment with compressors.
11. Elevator equipment, where applicable.

1.06 QUALIFICATIONS

A. The short-circuit, protective device coordination and arc flash hazard analysis studies shall be conducted under the responsible charge and approval of a Registered Professional Electrical Engineer skilled in performing and interpreting the power system studies.

B. The Registered Professional Electrical Engineer shall be an employee of the equipment manufacturer or an approved engineering firm.

C. The Registered Professional Electrical Engineer shall have a minimum of five (5) years of experience in performing power system studies.

D. The approved engineering firm shall demonstrate experience with Arc Flash Hazard Analysis by submitting names of at least ten actual arc flash hazard analyses it has performed in the past year.

E. The engineering firm shall have a minimum of twenty-five (25) years experience in performing power system studies.

1.07 COMPUTER ANALYSIS SOFTWARE

A. The studies shall be performed using SKM Systems Analysis Power*Tools for Windows (PTW) software program.

PART 2 PRODUCT

2.01 STUDIES

A. The contractor shall furnish an Arc Flash Hazard Analysis Study per NFPA 70E -Standard for Electrical Safety in the Workplace, reference Article 130.3 and Annex D. This study shall also include short-circuit and protective device coordination studies. All studies to be prepared by a Professional Engineer.

2.02 DATA

A. Contractor shall furnish all data as required for the power system studies. The Engineer performing the short-circuit, protective device coordination and arc flash hazard analysis studies shall furnish the Contractor with a listing of required data immediately after award of the contract. The Contractor shall expedite collection of the data to assure completion of the studies as required for final approval of the distribution equipment shop drawings and/or prior to the release of the equipment for manufacturing.

B. Source combination may include present and future motors and generators.

C. Load data utilized may include existing and proposed loads obtained from Contract Documents provided by Owner, or Contractor.

D. If applicable, include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

2.03 SHORT-CIRCUIT ANALYSIS

A. Transformer design impedances shall be used when test impedances are not available.

B. Provide the following:

1. Calculation methods and assumptions
2. Selected base per unit quantities
3. One-line diagram of the system being evaluated that clearly identifies individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location and other information pertinent to the computer analysis. The study shall include input circuit data including electric utility system characteristics, source impedance data, conductor lengths, number of conductors per phase, conductor impedance values, insulation types, transformer impedances and X/R ratios, motor contributions, and other circuit information as related to the short-circuit calculations.
4. Tabulations of calculated quantities including short-circuit currents, X/R ratios, equipment short-circuit interrupting or withstand current ratings and notes regarding adequacy or inadequacy of the equipment rating.
5. Results, conclusions, and recommendations. A comprehensive discussion section evaluating the adequacy or inadequacy of the equipment must be provided and include recommendations as appropriate for improvements to the system.

C. For solidly-grounded systems, provide a bolted line-to-ground fault current study for applicable buses as determined by the engineer performing the study.

D. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short circuit ratings
2. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses
3. The preparer shall notify Owner in writing, of any circuit protective devices improperly rated for the calculated available fault current.

2.04 PROTECTIVE DEVICE TIME-CURRENT COORDINATION ANALYSIS

A. Protective device coordination time-current curves (TCC) shall be displayed on log-log scale graphs.

B. Include on each TCC graph, a complete title with descriptive device names.

C. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

D. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.

E. Plot the following characteristics on the TCC graphs, where applicable:

1. Electric utility's overcurrent protective device
2. Medium voltage equipment overcurrent relays
3. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands
4. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands
5. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves
6. Medium voltage conductor damage curves
7. Ground fault protective devices, as applicable
8. Pertinent motor starting characteristics and motor damage points, where applicable
9. Pertinent generator short-circuit decrement curve and generator damage point
10. The largest feeder circuit breaker in each motor control center and applicable panelboard.

F. Provide adequate time margins between device characteristics such that selective operation is provided, while providing proper protection.

G. Provide the following:

1. A One-line diagram shall be provided which clearly identifies individual equipment buses, bus numbers, device identification numbers and the maximum available short-circuit current at each bus when known.
2. A sufficient number of log-log plots shall be provided to indicate the degree of system protection and coordination by displaying the time-current characteristics of series connected overcurrent devices and other pertinent system parameters.
3. Computer printouts shall accompany the log-log plots and will contain descriptions for each of the devices shown, settings of the adjustable devices, and device identification numbers to aid in locating the devices on the log-log plots and the system one-line diagram.
4. The study shall include a separate, tabular printout containing the recommended settings of all adjustable overcurrent protective devices, the equipment designation where the device is located, and the device number corresponding to the device on the system one-line diagram

5. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for addressing system protection or device coordination deficiencies.
6. Professional Engineer shall notify Owner in writing of any significant deficiencies in protection and/or coordination. Provide recommendations for improvements.

2.05 ARC FLASH HAZARD ANALYSIS

A. The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA70E-2009, Annex D. The arc flash hazard analysis shall be performed in conjunction with the short-circuit analysis (Section 2.03) and the protective device time-current coordination analysis (Section 2.04)

B. The flash protection boundary and the incident energy shall be calculated at significant locations in the electrical distribution system (switchboards, switchgear, motor-control centers, panelboards, busway and splitters) where work could be performed on energized parts.

C. Circuits 240V or less fed by single transformer rated less than 125 kVA may be omitted from the computer model and will be assumed to have a hazard risk category 0 per NFPA 70E.

D. Working distances shall be based on IEEE 1584. The calculated arc flash protection boundary shall be determined using those working distances.

E. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations

F. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location in a single table. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum. Conversely, the maximum calculation will assume a maximum contribution from the utility. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable as well as any stand-by generator applications.

   The Arc-Flash Hazard Analysis shall be performed utilizing mutually agreed upon facility operational conditions, and the final report shall describe, when applicable, how these conditions differ from worst-case bolted fault conditions.

G. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors should be decremented as follows:

   1. Fault contribution from induction motors should not be considered beyond 5 cycles.

H. For each piece of ANSI rated equipment with an enclosed main device, two calculations shall be made. A calculation shall be made for the main cubicle, sides, or rear; and shall be based on a device located upstream of the equipment to clear the arcing fault. A second calculation shall be made for the front cubicles and shall be based on the equipment's main device to clear the arcing fault. For all other non-ANSI rated equipment, only one calculation shall be required and it shall be based on a device located upstream of the equipment to clear the arcing fault.

I. When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.

J. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

K. Arc Flash calculations shall be based on actual overcurrent protective device clearing time. A maximum clearing time of 2 seconds will be used based on IEEE 1584-2002 section B.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

L. Provide the following:

1. Results of the Arc-Flash Hazard Analysis shall be submitted in tabular form, and shall include device or bus name, bolted fault and arcing fault current levels, flash protection boundary distances, working distances, personal-protective equipment classes and AFIE (Arc Flash Incident Energy) levels.
2. The Arc-Flash Hazard Analysis shall report incident energy values based on recommended device settings for equipment within the scope of the study.
3. The Arc-Flash Hazard Analysis may include recommendations to reduce AFIE levels and enhance worker safety.

PART 3 EXECUTION

3.01 FIELD ADJUSTMENT

A. Contractor shall adjust relay and protective device settings according to the recommended settings table provided by the coordination study.

B. Contractor shall make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.

C. The Professional Engineer shall notify Owner in writing of any required major equipment modifications.

3.02 ARC FLASH LABELS

A. The Professional Engineer shall provide a 4.0 in. x 4.0 in. Brady thermal transfer type label of high adhesion polyester for each work location analyzed.

B. The labels shall be designed according to the following standards:

1. UL969 – Standard for Marking and Labeling Systems
2. ANSI Z535.4 – Product Safety Signs and Labels
3. NFPA 70 (National Electric Code) – Article 110.16

C. The label shall include the following information:

1. System Voltage
2. Flash protection boundary
3. Personal Protective Equipment category
4. Arc Flash Incident energy value (cal/cm²)

5. Limited, restricted, and prohibited Approach Boundaries
6. Study report number and issue date

D. Arc flash labels shall be provided for equipment as identified in the study and the respective equipment access areas per the following:

1. Floor Standing Equipment - Labels shall be provided on the front of each individual section. Equipment requiring rear and/or side access shall have labels provided on each individual section access area. Equipment line-ups containing sections with multiple incident energy and flash protection boundaries shall be labeled as identified in the Arc Flash Analysis table.
2. Wall Mounted Equipment – Labels shall be provided on the front cover or a nearby adjacent surface, depending upon equipment configuration.
3. General Use Safety labels shall be installed on equipment in coordination with the Arc Flash labels. The General Use Safety labels shall warn of general electrical hazards associated with shock, arc flash, and explosions, and instruct workers to turn off power prior to work.

E. Labels shall be field installed by electrical contractor. The technician providing the installation shall have completed an 2-Hour instructor led Electrical Safety Training Course with includes NFPA 70E material including the selection of personal protective equipment.

3.03 ARC FLASH TRAINING

A. The vendor supplying the Arc Flash Hazard Analysis shall train the owner's qualified electrical personnel of the potential arc flash hazards associated with working on energized equipment (minimum of 4 hours). The training shall be certified for continuing education units (CEUs) by the International Association for Continuing Education Training (IACET) or equivalent. The trainer shall be an authorized OSHA Outreach instructor.

B. The vendor supplying the Arc Flash Hazard Analysis shall offer instructor led and online NFPA 70E training classes.

END OF SECTION

SECTION 260600 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1. Comply with UL 467.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Grounding Conductors, Cables, Connectors, and Rods:

a. Chance/Hubbell.

b. Copperweld Corp.

c. Erico Inc.; Electrical Products Group.

d. ILSCO.

e. O-Z/Gedney Co.; a business of the EGS Electrical Group.

f. Raco, Inc.; Division of Hubbell.

g. Superior Grounding Systems, Inc.

h. Thomas & Betts, Electrical.

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 26 Section "Conductors and Cables."

B. Equipment Grounding Conductors: Insulated with green-colored insulation.

C. Grounding Electrode Conductors: Stranded copper cable, #4 AWG minimum.

D. Underground Conductors: Bare, tinned, stranded copper, unless otherwise indicated.

E. Bare Copper Conductors: Comply with the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

F. Copper Bonding Conductors: As follows:

1. Bonding Cable: Minimum size of 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch (6.4 mm) in diameter.
2. Bonding Conductor: Minimum size of No. 6AWG, stranded copper conductor.
3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; minimum size of 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.

G. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.3 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.

C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.4 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel.

1. Size: 5/8 by 120 inches.

PART 3 - EXECUTION

3.1 APPLICATION

A. Multiple Disconnecting Means Enclosures: Comply with NEC article 250.64(D).

B. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.

C. In raceways, use insulated equipment grounding conductors.

D. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections.

E. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

F. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Use insulated spacer; space 1 inch (25.4 mm) from wall and support from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.

G. Underground Grounding Conductors: Use copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade or bury 12 inches (300 mm) above duct bank when installed as part of the duct bank.

3.2 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install insulated equipment grounding conductors in all feeders and branch circuits.

1. Bond the grounding conductor to each pullbox, junction box, outlet box, cabinets, and other enclosure through which the ground conductor passes.

C. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 6 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6.4-by-50-by-300-mm) grounding bus.

2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

A. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.

1. Drive ground rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.

2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging copper coating.

B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. Electrical Utility Service: Provide grounding and bonding at Utility Company’s metering equipment and pad-mounted transformer in accordance with Utility Company’s requirements.

E. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

F. Water Meter and Filter Piping: Use braided-type bonding jumpers to electrically bypass water meters, filters or other serviceable equipment. Connect to pipe with grounding clamp connectors.

G. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.

H. Bond the grounding electrode system to the structural steel of building, if any, using exothermic weld. Coordinate work with the General Contractor.

I. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NEC Article 250, using a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within the base of the foundation. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to a grounding electrode external to concrete. Coordinate work with the General Contractor.

J. To ensure proper grounding, a separate, green #6 copper stranded wire shall be provided & extend from the main distribution frame (MDF) to all intermediate distribution frames (IDF) and all other wiring closets back to the main electrical service entrance central ground reference location. Grounding and bonding shall conform to requirements and TIA/EIA-607 standard.

K. A ground buss bar shall be installed at the telephone termination board. It shall have insulated standoffs and be pre-drilled with an array of ¼" holes. The buss bar size shall be ¼" x 4" x 14". All connections to the buss bars shall be made via non-reversible crimp style one or two hole connectors.

L. See grounding detail on the drawings.

3.4 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact. Remove all point from points of contact prior to making connections.
3. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.5 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING (Where applicable)

A. Pad-Mounted Transformers and Switches: Install four ground rods and counterpoise circling pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Use tinned-copper conductor not less than No. 1/O AWG (minimum) for counterpoise and for taps to equipment ground pad. Bury counterpoise not less than 18 inches (450 mm) below grade and 6 inches (150 mm) from the foundation. Coordinate with electrical utility requirements.

3.6 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Perform tests, by the fall-of-potential method according to IEEE 81.

2. Measure ground resistance from the system neutral connection at the service entrance to convenient ground reference point using suitable ground testing equipment. Resistance shall not exceed 5 ohms.

3. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260600

SECTION 261200 - CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 QUALITY ASSURANCE

A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

B. Comply with NFPA 70.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

1.5 COORDINATION

A. Coordinate layout and installation of cables with other installations.

B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wires and Cables:

a. American Insulated Wire Corp.; Leviton Manufacturing Co.

b. BICC Brand-Rex Company.

c. Carol Cable Co., Inc.

d. Senator Wire & Cable Company.

e. Southwire Company.

2. Connectors for Wires and Cables:

   a. AMP Incorporated.

   b. General Signal; O-Z/Gedney Unit.

   c. Square D Co.; Anderson.

   d. 3M Company; Electrical Products Division.

2.2 BUILDING WIRES AND CABLES

A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Wire and Insulation Applications" Article.

B. Thermoplastic Insulation Material: Comply with NEMA WC-70 (ICEA S-95-658).

C. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC-70 (ICEA S-95-658).

D. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC-70 (ICEA S-95-658).

E. Conductor Material: Copper.

F. Stranding: Solid conductor for No. 12 AWG and smaller; stranded conductor for No. 8 AWG and larger. No. 10 AWG to be either solid or stranded (contractor’s option).

2.3 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

B. All branch circuit wiring connections shall be made using wire nut connectors which provide direct wire to wire contact. Connectors which utilize insulation displacement, intermediate metal or spring compression connection are not acceptable.

2.4 HEAT TRACE CABLES (WHERE APPLICABLE)

A. Provide UL listed heat trace cable where indicated on electrical drawings. Heating cables shall be equal to Nelson LT Self-Regulating Heating Cable, 8 watts per foot, powered by 120VAC and adjust its power with the use of a TF4X40 temperature control device. The system shall include all necessary components, including PLT-BCJ-## power connection and PLT-L120 end of circuit light kits (verify pipe sizes with mechanical contractor).

1. The heating cable shall consist of flat, flexible electric heater of parallel circuit construction with a continuous core of self-regulating polymer material. The core shall be insulated with fluoro-polymer over-jacked and covered with metal braid shield. The cable shall be cut to length in the field. Fasten linearly installed cable to pipe inside insulation with GT-60 fiberglass tape at 12” intervals. Valves shall have cable spiraled around each side of the valve. Install manufacturer furnished heat trace caution signs at 10’ intervals.

2. Similar products by Easy Heat, Heat Trace LTD, Raychem, Thermon, Newtron, Acutron, and Dekotron shall be considered equal for bidding purposes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRE AND INSULATION APPLICATIONS

A. Service Entrance: Type XHHW or THWN, in raceway.

B. Feeders: Type THHN/THWN, in raceway.

C. Branch Circuits: Type THHN/THWN, in raceway. MC Cable may be used where allowed per NEC for specific installation locations.

D. Fire Alarm Circuits: Power-limited, fire-protective, signaling circuit cable, in raceway.

E. Fire Alarm Circuits: Type THHN/THWN, in raceway.

F. Class 1 Control Circuits: Type THHN/THWN, in raceway.

G. Class 2 Control Circuits: Power-limited cable, concealed in building finishes or in raceway where installed exposed in finished public spaces.

H. Class 2 Control Circuits: Type THHN/THWN, in raceway.

3.3 INSTALLATION

A. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."

B. Unless otherwise noted or shown on the drawings, a maximum of three circuits (three phase conductors, neutrals, and ground) shall be allowed in a single home run raceway.

C. Multi-wire Branch Circuits: Sharing of neutrals is not allowed, provided dedicated neutral for each branch circuit.

D. Rooftop Circuits: Where conduits are installed exposed on rooftops, apply additional temperature adjustments listed in the NEC table 310.15(B)(2)(c) to ambient temperature correction factors listed in NEC table 310.16.

E. Wire size on 120 volt, 20 ampere branch circuit home run conductors over 75 feet in length (from the closest wiring device at the home run designation to the associated panelboard shown on the electrical drawing sheets), shall be increased to No. 10 AWG (minimum) to limit excessive voltage drop.

F. All corridor lighting branch circuits shall be increased to No. 10 AWG (minimum) through-out to limit excessive voltage drop.

G. All exterior lighting branch circuits shall be increased to No. 10 AWG (minimum) through-out to limit excessive voltage drop.

H. All lighting branch circuit home run conductors shall be increased to No. 10 AWG (minimum) (from the last light fixture at the home run designation shown on the electrical drawing sheets to the associated panelboard) to limit excessive voltage drop.

I. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

J. Use pulling means; including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

K. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

L. Support cables according to Division 26 Section "Basic Electrical Materials and Methods."

M. Seal around cables penetrating fire-rated elements according to 260500 and Division 7 Section "Firestopping."

N. Identify wires and cables according to Division 26 Section "Basic Electrical Materials and Methods."

3.4 CONNECTIONS

A. Conductor Splices: Keep to minimum.

B. Install splices and tapes that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.

C. Use splice and tap connectors compatible with conductor material.

D. Wiring at Outlets: Install pigtail conductor at each outlet, with at least 8 inches of slack. Where multiple sets of conductors enter a box, provide 8” pigtails to devices and make connections such that the continuity of the branch circuit conductors is not dependent upon device connections and the continuing load is not routed through the device. All unused device terminal screws shall be turned completely in, provide two full wraps of electrical tape around all device terminals. On 20 amp circuits where #10 AWG conductors are required for home runs, provide #12 AWG solid pigtails for connection to device. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.

E. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

3.5 FIELD QUALITY CONTROL

A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements. Perform each visual and mechanical inspection test stated in NETA ATS, Section 7.3.

B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 261200

SECTION 261300 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.3 SUBMITTALS

A. Product Data: For floor boxes, hinged-cover enclosures, and cabinets.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

B. Electrical Contractor shall furnish and install embedded electrical conduit, electrical box assemblies, and required hardware into the precast wall panels.

1. The Electrical Contractor will provide locations on the precast shop drawing submittal and tradesmen in the precast production plant for this scope of work.

2. Precast Supplier will provide coordination and production schedule with dates for each individual panel requiring electrical so the Electrical Contractor can schedule their workforce accordingly.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products one of the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Shamrock Steel.
10. Wheatland Tube Co.

B. Rigid Steel Conduit: ANSI C80.1.

C. IMC: ANSI C80.6.

D. PVC Coated Rigid Steel Conduit: NEMA RN 1.

E. EMT and Fittings: ANSI C80.3.

1. Fittings: Steel, set-screw or compression type with insulated bushings for protection of conductors. Diecast fittings are not approved.

F. FMC: Zinc-coated steel.

G. LFMC: Flexible steel conduit with PVC jacket.

2.2 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American International.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corp.
4. Cantex Inc.
5. Certainteed Corp.; Pipe & Plastics Group.
6. Condux International.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; Division of Hubbell, Inc.
12. Spiralduct, Inc./AFC Cable Systems, Inc.
13. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

C. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.

D. LFNC: UL 1660.

2.3 METAL WIREWAYS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hoffman.
2. Square D.
3. Mono Systems, Inc.

B. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 1.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

E. Wireway Covers: Screw-cover type.

F. Finish: Manufacturer's standard enamel finish.

2.4 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Airey-Thompson Sentinel Lighting; Wiremold Company (The).
b. Thomas & Betts Corporation.
c. Mono-Systems, Inc.
d. Walker Systems, Inc.; Wiremold Company (The).
e. Wiremold Company (The); Electrical Sales Division.

B. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
4. Hoffman.
5. Hubbell, Inc.; Killark Electric Manufacturing Co.
6. O-Z/Gedney; Unit of General Signal.

7. RACO; Division of Hubbell, Inc.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet-PLM Division.
10. Spring City Electrical Manufacturing Co.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Outlet boxes shall be galvanized steel standard electrical type with knockout openings as required.

C. Outlet boxes shall be at least 1-1/2" deep, single or gang style type of sized to accommodate devices noted. Outlet boxes in masonry walls may be special masonry type. Outlet boxes on exposed conduit runs in unfinished areas and equipment rooms shall be 4" square or multi-gang boxes with matching raised covers. Outlet boxes on exposed conduit runs in finished areas or where indicated, shall be cast FS type.

1. Outlet boxes for communications outlets shall be a minimum of 2-1/8" deep.

D. Exterior outlet boxes shall be cast aluminum type with weatherproof cover and gasket. Outlet boxes for receptacle devices shall be provided with grounding lead lug or screw.

E. Outlet boxes installed in plaster, plasterboard, acoustic tile, or paneled surfaces shall be provided with plaster rings, except 4" octagonal ceiling boxes. Outlet boxes installed in masonry, tile, or concrete surfaces shall be provided with square corner type extension rings where special masonry boxes are not used.

F. Outlet boxes noted as WP (weatherproof) shall be a flush or surface (as noted) FS type box with at least 4 machine screw connections for a gasketed device or cover.

G. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

H. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

I. Nonmetallic Outlet and Device Boxes: NEMA OS 2.

J. Comply with NEC 605 for systems furniture connection requirements as coordinated with the furniture supplier.

K. Floor Boxes (Two Devices): Floor boxes installed in tile or carpet floors shall be equal to Steel City 664 Series. Concealed service type, 2-compartment, steel construction with solid aluminum #664-CST-SW-ALM hinged floor plate and retractable exit port for power cords and communications cables. Provide internal device mounting panels compatible with devices being installed. Provide wiring and communications devices as shown on the floor plans and specified.
1. Coordinate floor box types and covers in commercial kitchens with the food service equipment supplier as required for the receptacles to accommodate plug and cord associated with kitchen equipment.

L. Floor Boxes (Two Devices): Floor boxes installed in wood floors shall be equal to Wiremold Walker Wood Floor Series. 2-compartment steel type with flush activation assembly, two-gang aluminum flange and cover plates. Assembly shall be equal to Wiremold 880W2 floor box, 827B flange, and 828R cover plates. Where GFI receptacles are to be installed, provide 828GFI cover plates. Provide wiring and communications devices as shown on the floor plans and specified.

M. Floor Boxes (Up to Four Devices): Floor boxes installed in tile or carpet floors shall be equal to Steel City 665 Series. Concealed service type, 4-compartment, steel construction with solid aluminum #665-CST-SW-ALM hinged floor plate and retractable exit port for power cords and communications cables. Provide internal device mounting panels compatible with devices being installed. Provide wiring and communications devices as shown on the floor plans and specified.

1. Coordinate floor box types and covers in commercial kitchens with the food service equipment supplier as required for the receptacles to accommodate plug and cord associated with kitchen equipment.

N. A/V Support Floor Boxes: Floor boxes installed in tile or carpet floors shall be equal to Steel City 665 AV2 Series. Concealed service type, 4-compartment, 2" knock-outs, steel construction with solid aluminum #665-CST-SW-ALM hinged floor plate and retractable exit port for power cords and communications cables. Provide internal device mounting panels compatible with devices being installed. Provide wiring and communications devices as shown on the floor plans and specified.

O. Floor Boxes (Three Devices): Floor boxes installed in wood floors shall be equal to Wiremold Walker Wood Floor Series. 3-compartment steel type with flush activation assembly, three-gang aluminum flange and cover plates. Assembly shall be equal to Wiremold 880W3 floor box, 837B flange, and 838R cover plates. Where GFI receptacles are to be installed, provide 838GFI cover plates. Provide wiring and communications devices as shown on the floor plans and specified.

P. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

Q. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

R. Provide wall plates for all unused outlet and device boxes. Wall plates shall comply with section 261400.

S. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Provide backplate and grounding as required by the authority having jurisdiction for installation of indicated equipment.

T. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

2.6 FACTORY FINISHES

A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer standard paint applied to factory-assembled surface raceways, enclosures, and cabinets before shipping.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. ENT – Electrical Non-metallic Tubing is not acceptable for use anywhere on this project.

B. Outdoors:

1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC, see installation for additional requirements.
4. Underground, Grouped: RNC, see installation for additional requirements.
5. Underslab: RNC, see installation for additional requirements.
6. Embedded in slab: Rigid steel.
7. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
8. Boxes and Enclosures: NEMA 250, Type 3R.

C. Indoors:

1. Exposed: EMT.
2. Concealed: EMT. MC Cable may be used where allowed per NEC for specific installation locations.
3. Underslab: RNC, see installation for additional requirements.
4. Embedded in slab: Rigid steel.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
6. Damp or Wet Locations: Rigid steel conduit.
7. Boxes and Enclosures: NEMA 250, Type 1, except as follows:

    a. Damp or Wet Locations: NEMA 250, Type 4, nonmetallic.

D. Minimum Raceway Size: ½-inch trade size (DN16), except home runs from the closest wiring device or light fixture at the home run designation to the associated panelboard shown on the electrical drawing sheets shall be ¾-inch (minimum) trade size (DN21).

E. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings with insulated bushings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

3.2 INSTALLATION

A. Install raceways, boxes, enclosures, and cabinets as indicated and in accordance to manufacturer's written instruction.
1. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
2. Install raceways level and square and at proper elevations. Provide adequate headroom.
3. Complete raceway installation before starting conductor installation.

4. Support raceways as specified in Division 26 Section "Basic Electrical Materials and Methods."
5. Install temporary closures to prevent foreign matter from entering raceways.
6. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab. Install a metal sleeve or concrete curb to provide a 4 inch high watertight barrier.
7. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
8. Metal-corrugated sheet roof decking: Install and support so that nearest outside surface of the raceway or box is not less than 1.5” from the nearest surface of the roof decking. In addition, cables, raceways, and enclosures shall not be installed in concealed locations of metal-corrugated sheet decking type roofing. Spacing from roof decking doesn’t apply to rigid metal conduit or intermediate metal conduit.
9. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
    a. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
10. Exterior raceways:
    a. Install a minimum 24 inches below grade.
    b. Where multiple conduit runs are indicated, they shall be installed in the same trench.
    c. Where raceways stub into sub-grade levels, utilize installation methods to prevent migration of water into the building interior spaces.
    d. All 90 degree ells 1” trade size or larger must be rigid steel conduit.
    e. Transition to rigid steel conduit before the conduit is exposed.
    f. Metallic conduit exterior or within building limits, that is 1” trade size or larger and in contact with earth, shall be galvanized rigid conduit with factory applied vinyl plastic coating or galvanized rigid conduit painted with heavy coat of bitumastic paint. Couplings shall be painted after assembly. Nicks in plastic coated conduit shall be painted with plastic material as recommended by the manufacturer. Where bitumastic paint is applied, the paint must be thoroughly dry prior to backfilling.
    g. Provide warning tape in accordance with specification section 260500.
11. Raceways underground or under slabs:
    a. All 90 degree ells 1” trade size or larger must be rigid steel conduit.
    b. Transition to rigid steel conduit before the conduit is exposed.
    c. Metallic conduit exterior or within building limits, that is 1” trade size or larger and in contact with earth, shall be galvanized rigid conduit with factory applied vinyl plastic coating or galvanized rigid conduit painted with heavy coat of bitumastic paint. Couplings shall be painted after assembly. Nicks in plastic coated conduit shall be painted with plastic material as recommended by the manufacturer. Where bitumastic paint is applied, the paint must be thoroughly dry prior to backfilling.
    d. Provide expansion fittings where conduits cross building expansion joints or where a wide temperature differential exists.
12. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 1 inch (25 mm) of concrete cover.
    a. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
    b. Space raceways laterally to prevent voids in concrete.
    c. Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
    d. Provide expansion fittings where conduits cross building expansion joints or where a wide temperature differential exists.

13. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
    a. Run parallel or banked raceways together on common supports.
    b. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
14. Outlet boxes shall be concealed except where shown or noted otherwise. Outlet boxes, plaster rings or extension rings shall be installed flush with the finished surface.
15. Where applicable, outlet boxes for controls and operating mechanisms shall be installed to comply with ADA mounting height requirements.
16. Junction and Pull Boxes
    a. Where necessary to terminate, tap-off, or redirect multiple conduit runs, provide and install appropriately sized junction boxes. Furnish and install pull boxes where necessary in the raceway system to facilitate conductor installation. Provide pull boxes to limit conduit runs to less than 150 feet and to contain no more than the equivalent of three right angle bends.
    b. Use outlet boxes as junction boxes and pull boxes wherever possible and allowed by applicable codes. Make all boxes accessible and do not install boxes in finished areas. Mount all boxes plumb and level. Use flush mounted boxes with concealed conduits and make edges of boxes flush with the final surface.
    c. Install boxes supported independently of conduit by attachment to the building structure or a structural member.
17. Join raceways with fittings designed and approved for that purpose and make joints tight.
    a. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
    b. Use insulating bushings to protect conductors.
18. Tighten set screws of threadless fittings with suitable tools.
19. Terminations:
    a. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
    b. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
20. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
21. Telephone and Signal System Raceways for free air cabling technique. 2 Inch Trade Size (DN 53) and smaller. Provide minimum ¾ inch conduit from outlet box to 8 inches above accessible lay-in ceiling system, terminate with insulated bushing. Provide empty conduits, appropriately sized for the application, through floors and walls, above hard ceilings, and at exposed ceiling structure locations to provide clear and smooth pathways for cabling. Coordinate cable pathway requirements with data and voice cabling contractor.
22. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
    a. Service entrance conduits.
    b. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
    c. Where conduits enter or exit the building.
    d. Where otherwise required by NFPA 70.

23. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.
24. Flexible Connections: Use maximum of 72 inches (48 inches in ducts and plenums) of flexible conduit for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.
25. Do not utilize aluminum conduit.
26. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.
    a. Select each surface raceway outlet box, to which a lighting fixture is attached, to be of sufficient diameter to provide a seat for the fixture canopy.
    b. Where a surface raceway is used to supply a fluorescent lighting fixture having central-stem suspension with a backplate and canopy (with or without extension ring), no separate outlet box is required.
    c. Provide surface metal raceway outlet box, backplate, and canopy at the feed-in location of each fluorescent lighting fixture having end-stem suspension.
    d. Where a surface metal raceway extension is made from an existing outlet box on which a lighting fixture is installed, no additional surface-mounted outlet box is required. Provide a backplate slightly smaller than the fixture canopy.
27. Set floor boxes level. Trim after installation to fit flush with finished floor surface.
28. Install hinged-cover enclosures and cabinets plumb. Support at each corner.
29. Direct Buried Conduit Backfill: Comply with Division 2 requirements.

B. Location of Outlets and Equipment.
1. Outlets shall be installed at the heights and approximate designated positions as shown on the Drawings and symbol legend, unless otherwise directed. Outlets in similar rooms shall be installed in the same relative location in each room. Outlets shall not be installed back to back but shall be offset approximately 6 inches.
2. Outlets shall be located to clear piping, ductwork, and other obstructions. Switch outlets shall be on the latch side of door except where type of construction dictates otherwise. Outlets in masonry or tile shall be located as far as practical adjacent to horizontal and vertical mortar joints to minimize cutting.
3. Verify locations and dimensions of electrical equipment, particularly in the case of door swings, heights of cabinets and counters, shelves, and location of equipment installed by the Owner or other trades.
4. Mounting heights indicated on the drawings shall be to center line of outlet unless indicated otherwise. Heights may be adjusted to align with mortar joints as specified above, however, all similar outlets in a given area shall be adjusted to the same height unless specifically noted at the outlet.
5. Receptacle outlets indicated to be installed “A.C.” (above counter) shall be mounted not less than 3 inches higher than the top of the counter backsplash or at heights indicated.
6. All similar equipment such as panelboards, motor starters, disconnect switches, etc., shall be installed at the same heights throughout the building.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.4 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION 261300

SECTION 261400 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes receptacles, connectors, switches, and finish plates.

1.3 DEFINITIONS

A. GFCI: Ground-fault circuit interrupter.

1.4 SUBMITTALS

A. Product Data: For each product specified.

B. Shop Drawings: Legends for receptacles and switch plates.

C. Maintenance Data: For materials and products to include in maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NEMA WD 1.

C. Comply with NFPA 70.

1.6 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wiring Devices:

a. Bryant Electric, Inc.
b. Eagle Electric Manufacturing Co., Inc.
c. GE Company; GE Wiring Devices.
d. Hubbell, Inc.; Wiring Devices Div.
e. Killark Electric Manufacturing Co.
f. Leviton Manufacturing Co., Inc.
g. Pass & Seymour/Legrand; Wiring Devices Div.
h. Pyle-National, Inc.; an Amphenol Co.

2. Wiring Devices for Hazardous (Classified) Locations:

a. Crouse-Hinds Electrical Co.; Distribution Equipment Div.
b. Killark Electric Manufacturing Co.
c. Pyle-National, Inc.; an Amphenol Co.

3. Multi-outlet Assemblies:

a. Airey-Thompson Co.
b. Mono Systems, Inc.
c. Wiremold.
d. Panduit.

4. Floor Service Outlets:

a. American Electric.
b. Hubbell, Inc.; Wiring Devices Div.
c. Mono Systems, Inc.
d. Pass & Seymour/Legrand; Wiring Devices Div.
e. Square D Co.
f. Wiremold.

2.2 RECEPTACLES

A. Straight-Blade and Locking Receptacles: Hard use (heavy duty) specification grade, minimum 20A rating, side wired.

B. GFCI Receptacles: Feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a standard outlet box without an adapter.

C. Industrial Heavy-Duty Receptacle: Comply with IEC 309-1.

D. Hazardous (Classified) Location Receptacles: Comply with NEMA FB 11.

2.3 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.

1. Cord: Rubber-insulated, stranded-copper conductors, with type SOW-A jacket. Green-insulated grounding conductor, and equipment-rating ampacity plus a minimum of 30 percent.
2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.4 SWITCHES

A. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.

1. Switch: Heavy-duty grade, quiet type, 20A, 120/277-V ac.
2. Receptacle: NEMA WD 6, Configuration 5-20R.

B. Snap Switches: Heavy-duty, quiet type, 20A, 120-277 volt – AC, with back and side wired screw terminals; Pass & Seymour PS20AC-1 or equal. Single-pole or three-way to suit connections.

C. Dimmer Switches: Modular, full-wave, solid-state units. Dimmers shall be equal to Lutron Diva Series, rated for 600W or 125% of the connected load, whichever is greater.

1. Control: Preset dimmer with continuously adjustable slide switch. Single-pole or three-way switch to suit connections.
2. Filters: Include electromagnetic filter to reduce interference with radio, audio, and video equipment.
3. Voltage Compensation: Include voltage compensation to compensate light output for variation in the AC line-voltage.
    a. LED Lighting Fixture Dimmers: Modular, 0-10V, 120V, or 277V, 60 Hz.

2.5 WALL PLATES

A. Single and combination types match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: 0.04-inch- (1-mm-) thick, Type 302, satin-finished stainless steel.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Wet Locations: Heavy duty die-cast zinc.
    a. Where required by the authority having jurisdiction, receptacle covers shall be “While in Use”, “Extra-Duty” type, equal to Intermatic WP3110MXD, or WP1030MXD, or WP1010HMXD series, consisting of heavy duty die cast construction with lockable hasp.
    b. Switch covers shall be similar to Steel City SW series.

2.6 FLOOR SERVICE FITTINGS

A. Floor Boxes: See Specification Section 261300.

B. Power Receptacle: NEMA WD 6, Configuration 5-20R, unless otherwise indicated.

C. Signal Outlet: Standard receptacle plate compatible with service unit and phone/data adapter to fit plate.

2.7 MULTIOUTLET ASSEMBLIES

A. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.

B. Raceway Material: Metal, with manufacturer's standard finish.

C. Wire: No. 12 AWG.

2.8 WIRING DEVICE FINISHES

A. Color: White, unless otherwise indicated or required by Code.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Switches shall be installed so that the handle is down when the switch in the off position.

B. Receptacle and switch branch circuit wiring shall be terminated on the side wired screw terminals.

C. In storage, mechanical, and electrical equipment rooms where the receptacle is located adjacent to the light switch at 46” AFF, the devices shall be installed in a combination cover-plate and back-box assembly.

D. GFI Receptacles: Ground fault circuit-interruption for personnel shall be provided as required in the NEC 210.8(A) through (C). The ground-fault circuit-interrupter shall be installed in a readily accessible location.

E. Wet Locations: All 15- and 20-ampere 125- and 250-volt non-locking receptacles shall be listed weather-resistant type.

F. Mechanical Equipment: Install service receptacles on vertical building surfaces or mount receptacles on the steel tubing and u-channel support/backboard assembly provided for mounting the enclosed controllers and switches. Do not mount service receptacles directly to mechanical equipment housings.

G. Install devices and assemblies level, plumb, and secure.

H. Where applicable, devices for controls and operating mechanisms shall be installed to comply with ADA mounting height requirements.

I. Provide tamper resistant receptacles as required by the NEC articles 210.52 and 406.1.

1. Contractor shall verify with the local AHJ areas of the facility requiring tamper resistant receptacles.

J. Install wall plates when painting is complete.

K. Install wall dimmers to achieve indicated rating after derating for ganging as instructed by manufacturer.

L. Provide a dedicated neutral for each branch circuit serving light fixtures connected to wall dimmers. Do not share neutral conductor on load side of dimmers.

M. Arrangement of Devices: Unless otherwise indicated, match existing.

1. Exterior receptacles shall be installed with long dimension horizontal, mounting height of approximately 25” above finish grade.

N. Protect devices and assemblies during painting.

O. Adjust locations at which floor service outlets and telephone/power service poles are installed to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

A. Comply with Division 26 Section "Basic Electrical Materials and Methods."

1. Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on wall plate.
2. Receptacles: Identify panelboard and circuit number from which served. Use durable wire markers or tags within outlet boxes.
3. Where receptacles are supplied through a GFCI breaker or connected “downstream” of a GFCI receptacle, the receptacle shall be marked “GFCI Protected”.

B. Provide panel and circuit labels as follows:

1. Light Switches and Receptacles on Normal Power: Provide labels on inside top portion of faceplate with circuit number and panel board.
2. Faceplate Labels for Receptacles and Light Switches on Emergency Power: Provide on outside of faceplate, centered on top of plate and label with circuit number and panelboard.
3. Faceplate Labels for Special Purpose Receptacles: Provide on outside of faceplate, centered on top of plate and label with receptacle voltage, amperage, phase and wires, e.g., 208V, 30A, 3PH, 5W.

3.3 CONNECTIONS

A. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.

B. Tighten electrical connectors and terminals according to manufacturer published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

C. Where multiple sets of conductors terminate at a box, provide pigtails to devices such that the continuity of the branch circuit conductors is not dependent upon device connections and the continuing load is not routed through the device. See section 261200 – Conductors and Cables.

3.4 FIELD QUALITY CONTROL

A. Test wiring devices for proper operation, polarity and ground continuity.

B. Test GFCI operation with both local and remote fault simulations according to manufacturer written instructions.

C. Replace damaged or defective components.

3.5 CLEANING

A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 261400

SECTION 26 1450 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes lighting control panels, time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.

B. Comply with State Energy Code as required.

1.3 SUBMITTALS

A. Product Data: Include dimensions and data on features, components, and ratings for lighting control devices.

B. Maintenance Data: For lighting control devices to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, for their indicated use and installation conditions by a testing agency acceptable to authorities having jurisdiction.

B. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.

C. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate features of devices specified in this Section with systems and components specified in other Sections to form an integrated system of compatible components. Match components and interconnections for optimum performance of specified functions. Include coordination with the following:

1. Division 26 Section "Panelboards."
2. Division 26 Section “LED Lighting.”

1.6 WARRANTY

A. Lighting control panel manufacturer shall supply a 2 year warranty on all hardware and software. A limited 10 year warranty shall be provided on the individual relays.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Exterior/Interior Lighting Control Panel:
   a. Leviton Manufacturing Litekeeper LK Series
   b. Hubbell Automation
2. Contactors and Relays:
   a. Automatic Switch Co.
   b. Cutler-Hammer Products; Eaton Corporation.
   c. Furnas Electric Co.
   d. GE Lighting Controls.
   e. Hubbell Lighting, Inc.
   f. Siemens Energy and Automation, Inc.
   g. Square D Co.; Power Management Organization.
3. Time Switches:
   a. General Electric
   b. Intermatic, Inc.
   c. Leviton Manufacturing.
   d. Paragon Electric Co., Inc.
   e. Tork, Inc.
4. Photoelectric Relays:
   a. Allen-Bradley/Rockwell Automation.
   b. Area Lighting Research, Inc.
   c. GE Lighting Controls
   d. Intermatic, Inc.
   e. Paragon Electric Co., Inc.
   f. Tork, Inc.
5. Occupancy Sensors:
   a. Arrow Hart Wiring Devices
   b. GE Lighting Controls
   c. Hubbell Lighting, Inc.
   d. Leviton Lighting Controls
   e. Lightolier
   f. Lutron.
   g. MYTECH
   h. Sensorswitch.
   i. Steinel.
   j. Sterner Lighting Systems, Inc.
   k. Tork, Inc.
   l. Touchplate.
   m. Watt Stopper, Inc.

2.2 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

A. Line-Voltage Surge Protection: Include in all 120- and 277-V solid-state equipment. Comply with UL 1449 and with ANSI C62.41 for Category A locations

2.3 INTERIOR/EXTERIOR LIGHTING CONTROL PANEL

A. The lighting controls shall be housed in a NEMA 1 enclosure.

B. The lighting control panel shall include 8 programmable switch inputs and 8 control relays.

C. The lighting control panel shall be microprocessor controlled with an integral 2 line (32 character) display and programming keypad.

D. Programmable intelligence shall include time of day control, 24 holiday dates, timed inputs, preset control, auto daylight savings, astronomical clock with offsets, and local control.

1. Time of Day Control: 64 time of day/holiday schedules for 365 day programming.
2. Holidays: 24 holiday dates with adjustable day spans.
3. Timed Inputs: Switch input timers 1-999 minutes.
4. Preset: Pre-programmed switch patterns.
5. Auto Daylight Savings: Automatically adjust the clock at the appropriate dates, selectable savings adjust.
6. Astronomical Clock with Offsets: Latitude input with sunset-sunrise offsets to customize outdoor lighting.
7. Local Control: From alpha-numeric keypad and local switch.

E. Control panel shall permit lighting control to be overridden ON for after hours use or cleaning. The controller shall provide optional switch timer assignments or timed overrides.

F. Relays may be designated as either normally open or normally closed from software. Relay status shall not only disclose commanded relay status but next scheduled state to occur.

G. Programming the control system shall be through the local integral keypad or optional PC program. PC software shall permit either local or remote controller programming. Descriptive information shall assist the user to employ the system without a programming manual.

H. Hardware features shall include the following.

1. Operator Interface.
   a. The control panel programming interface resides in firmware in the control panel. The programming interface shall consist of a circuit board mounted keypad capable of linking switch inputs to relay outputs and schedule assignments. Systems that utilize blocking diode technology for relay assignments shall not be acceptable. The integral keypad shall provide access to the main programming features. The keypad shall permit the user to manually command any or all relays individually. Each panel shall control its own loads from internal memory. A control system that relies on a central control computer/processor or external time clocks shall not be permitted.

2. Contact inputs:
   a. The control system shall allow dry contacts (Digital/Switch Inputs) for override purposes. Momentary 3 wire or 2 wire (toggle) and maintained contacts shall be supported as 2 wire (SPST) inputs. Inputs shall be dry contacts (24 VDC @ 12 ma. internally supplied to the inputs). An input shall be software link-able to any number of relays for override control.
   b. The controller shall provide timers for each switch input. Each switch input timer shall be capable of 0-999 minutes.
   c. Software shall enable or disable switch inputs based on Time of Day scheduling.
3. Relay Type:
   a. The system shall utilize control relays that are rated to at least 20 amps at 277 VAC. The relays shall be magnetically held and rated for 10 million mechanical operations. Relays that are latched or mechanically held are not acceptable. A limited 10 year warranty shall be provided on the individual relays.
4. Photocell Control:
   a. The controller shall accept input from user adjustable ambient light sensors for indoor and outdoor applications.
5. Integrated Design:
   a. The controller CPU board shall be mounted on a panel with removable hinge pins that shall permit easy change out of the processor and input board. The relay board shall be modular and designed for rapid field replacement or upgrading.
6. Diagnostic Aids:
   a. The controller shall incorporate diagnostic aids for confirmation of proper operation, or in case of failure these aids shall guide the individual in rapid troubleshooting of the system.
   b. The control panels shall employ a LCD display or LED's that indicate:
      1) POWER
      2) SYSTEM OK
      3) ON/OFF STATUS of EACH RELAY
      4) SYSTEM CLOCK and DATE
      5) PROGRAMMING CONFIRMATION
      6) TOD, HOLIDAY,ON/OFF, & PRESET
   c. Control systems that do not provide visual self help diagnostics shall not be acceptable.
7. Memory Back-up:
   a. The system shall utilize a memory back-up device that is system integrated and shall be non-serviceable. The data in RAM shall be protected against power interruptions lasting as long as 7 days. The power interrupt protection circuit shall be entirely maintenance-free.
8. Voltage Specific Transformer:
   a. The controller shall incorporate the use of a multi-tapped transformer. The controller shall require specification of voltage for each control location. The voltages of 120 & 277 VAC shall be available with each control panel.
9. Status Indication of Relays:
   a. The controller shall provide visible status indication of all relays through the window of each control panel. The visual indication shall disclose ON/OFF status and relay number.
10. Service Override & Priority Override:
    a. The control panel shall provide a three position master-service override for the entire panel. The service override shall not be accessible from the exterior.
    b. The master service override provides a single three position switch with the option of "ALL ON," "AUTO", and "ALL OFF", respectively. This master switch shall operate all of the relays in the controller. This switch shall override and supersede all commands from the logic board when the switch is in the "ALL ON or ALL OFF" position. The master switch shall function to override all the relays should the logic board programming differ from the space function.

c. The controller shall remember the last command to the individual relays. Upon returning the master override switch to the "AUTO" position, the relays shall return to the most recent command state. This will occur even if the last command happened during the master override condition.

11. Lockable Enclosure:
    a. Each control panel shall be enclosed in a lockable NEMA class 1 enclosure. The enclosure shall be manufactured out of 1/16" steel and shall provide pre-punched knockouts for efficient installation.

2.4 TIME SWITCHES

A. Description: Lighting control panel complying with UL 917 / 2018 IECC.

1. Two contacts, rated 30 A at 277-V ac, unless otherwise indicated. Provide additional contacts as required to provide individual control of areas less than 5,000 square feet.
2. Two pilot-duty contacts, rated 2 A at 240-V ac, unless otherwise indicated.
3. Have a minimum 7-day clock.
4. Be capable of being set for seven different day types per week.
5. Incorporate an automatic holiday “shutoff” feature, which turns off all controlled lighting loads for not fewer than 24 hours and then resumes normally scheduled operations.
6. Have program backup capabilities, which prevent the loss of program and time settings for not fewer than 10 hours, if power is interrupted.
7. Include an override switch that complies with the following:
    a. The override switch shall be manual control.
    b. The override switch, when initiated, shall permit the controlled lighting to remain on for not more than 2 hours.
    c. Any individual override switch shall control the lighting for an area not larger than 5,000 square feet.

2.5 PHOTOELECTRIC RELAYS

A. Description: Contacts rated to operate connected relay or contactor coils or microprocessor input, and complying with UL 773A.

B. Light-Level Monitoring Range: 0 to 500 fc, with an adjustment for turn-on/turn-off levels.

C. Fail mode shall be on.

D. Time Delay: Prevents false operation.

E. Indoor Ceiling- or Wall-Mounting Units: Adjustable for turn-on/turn-off levels, semi-flush, calibrated to detect adequacy of daylighting in perimeter locations, and arranged to turn artificial illumination on and off to suit varying intensities of available daylighting.

F. Outdoor Sealed Units: Weathertight housing, resistant to high temperatures and equipped with sun-glare shield and ice preventer.

2.6 OCCUPANCY SENSORS

A. Provide dual-tech sensors in accordance with applicable energy codes as shown on the drawings, however the installing contractor shall install one or more sensors in all areas shown with occupancy sensors that cover the entire space and all entrance points. The exact type, placement, and quantity of sensors required shall be per the manufacturer's best practice recommendations. The contractor and manufacturer's representative shall review floor plans and reflected ceiling plans to determine requirements.

B. Shop Drawings: Manufacturer's representative shall provide shop drawing floor plans showing devices locations, types, and coverage for the proposed sensors.

2.7 MULTI-POLE CONTACTORS AND RELAYS

A. Description: Electrically operated and mechanically held, and complying with UL 508 and NEMA ICS 2.

1. Current Rating for Switching: UL listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballasts with 15 percent or less total harmonic distortion of normal load current).
2. Control Coil Voltage: Match control power source.
3. Two-Wire Operation: Provide additional control relays as required for two wire operation associated with photocell and switching applications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install equipment level and plumb and according to manufacturer written instructions.

B. Mount lighting control devices according to manufacturer's written instructions and requirements in Division 26 Section "Basic Electrical Materials and Methods."

C. Mounting heights indicated are to bottom of unit for suspended devices and to center of unit for wall-mounting devices.

3.2 CONTROL WIRING INSTALLATION

A. Install wiring between sensing and control devices according to manufacturer's written instructions and as specified in Division 26 Section "Conductors and Cables" for low-voltage connections and Division 26 Section "Voice and Data Systems" for digital circuits.

B. Wiring Method: Install all wiring in raceway as specified in Division 26 Section "Raceways and Boxes."

C. Bundle, train, and support wiring in enclosures.

D. Ground equipment.

E. Connections: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Basic Electrical Materials and Methods."

B. Lighting Control Enclosure Nameplates: Label each lighting control panel and contactor with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

3.4 FIELD QUALITY CONTROL

A. Schedule visual and mechanical inspections and electrical tests with at least seven days' advance notice.

B. The lighting control system shall be programmed to execute and perform all functions required to effectively operate the site according to the owner and engineer requirements. Coordinate control system operation with engineer during shop drawing review.

C. Inspect control components for defects and physical damage, testing laboratory labeling, and nameplate compliance with the Contract Documents.

D. Check tightness of electrical connections with torque wrench calibrated within previous six months. Use manufacturer recommended torque values.

E. Verify settings of photoelectric devices with photometer calibrated within previous six months.

F. Electrical Tests: Use particular caution when testing devices containing solid-state components. Perform the following according to manufacturer's written instructions:

1. Continuity tests of circuits.
2. Operational Tests: Set and operate devices to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces actual operating functions.

    a. Include testing of devices under conditions that simulate actual operational conditions. Record control settings, operations, cues, and functional observations.

G. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.

H. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.

I. Reports: Written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.

3.5 CLEANING

A. Cleaning: Clean equipment and devices internally and externally using methods and materials recommended by manufacturers, and repair damaged finishes.

3.6 DEMONSTRATION

A. Coordinate with training for low-voltage, programmable lighting control system specified in Division 26 Section "Lighting Controls."

B. Engage a factory-authorized service representative to train Owner's maintenance personnel as specified below:

1. Train Owner's maintenance personnel on troubleshooting, servicing, adjusting, and preventive maintenance. Provide a minimum of four hours' training.
2. Training Aid: Use the approved final version of maintenance manuals as a training aid.
3. Schedule training with Owner, through Architect, with at least seven days' advance notice.

3.7 ON-SITE ASSISTANCE

A. Occupancy Adjustments: Within one year of date of Substantial Completion, provide up to three Project site visits, when requested, to adjust light levels, make program changes, and adjust sensors and controls to suit actual conditions.

END OF SECTION 26 1450

SECTION 262310 - PACKAGED ENGINE GENERATORS (NATURAL GAS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes packaged outdoor natural gas-engine generator sets with the following features and accessories:

1. Battery charger.
2. Engine generator set.
3. Muffler.
4. Exhaust piping external to set.
5. Outdoor enclosure.
6. Remote annunciator.
7. Remote stop switch.
8. Starting battery.
9. Load bank circuit breaker.

1.3 DEFINITIONS

A. Standby Rating: Power output rating equal to the power the generator set delivers continuously under normally varying load factors for the duration of a power outage.

B. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

C. Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in Hertz or cycles per second.

1.4 SUBMITTALS

A. Product Data: Include data on features, components, ratings, and performance. Include the following:

1. Dimensioned outline plan and elevation drawings of engine generator set and other components specified.
2. Thermal damage curve for generator.
3. Time-current characteristic curves for generator protective device.
4. Certified fuel consumption curves or charts.

B. Shop Drawings: Indicate fabrication details, dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Detail wiring for power and control connections and differentiate between factory-installed and field-installed wiring.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

D. Certified summary of prototype-unit test report.

E. Maintenance Data: For each packaged engine generator and accessories to include in maintenance manuals specified in Division 1. Include the following:

1. List of tools and replacement items recommended to be stored at the Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
2. Detail operating instructions for both normal and abnormal conditions.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain a service center capable of emergency maintenance and repairs at the Project with eight hours' maximum response time.

B. Source Limitations: Obtain packaged engine generator and auxiliary components specified in this Section through one source from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

D. Comply with NFPA 70.

E. Comply with NFPA 110 requirements for Level 1 emergency power supply system.

F. Comply with UL 2200, unless requirements of these Specifications are stricter.

G. Engine Exhaust Emissions: Engine shall be EPA certified by the manufacturer and shall comply with applicable state and local government requirements.

H. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of the installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver engine generator set and system components to their final locations in protective wrappings, containers, and other protection that will exclude dirt and moisture and prevent damage from construction operations. Remove protection only after equipment is safe from such hazards.

1.7 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace packaged engine generator and auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

A. Maintenance: At Substantial Completion, begin 12 months' full maintenance by skilled employees of the manufacturer's designated service organization. Include quarterly exercising to check for proper, starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Maintenance agreements shall include parts and supplies as used in the manufacture and installation of original equipment. Provide service agreement description in shop drawing submittal.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Caterpillar, Inc.; Engine Div.
2. Cummins Onan.
3. Detroit Diesel MTU Onsite Energy
4. Generac.
5. MTU Onsite Energy
6. Kohler Co; Generator Division.

2.2 ENGINE GENERATOR SET

A. Furnish a coordinated assembly of compatible components.

B. Safety Standard: Comply with ASME B15.1.

C. Nameplates: Each major system component is equipped with a conspicuous nameplate of component manufacturer. Nameplate identifies manufacturer of origin and address, and model and serial number of item.

D. Power Output Ratings: 175kW, 218.8kVA standby rating, 208-volts, 3-phase, 4-wire, 0.8PF, 60Hz. The output ratings shall be provided at specified ambient temperature range and altitude.

E. Skid: Adequate strength and rigidity to maintain alignment of mounted components without depending on a concrete foundation. Skid is free from sharp edges and corners. Lifting attachments are arranged to facilitate lifting with slings without damaging any components.

F. Rigging Diagram: Inscribed on a metal plate permanently attached to skid. Diagram indicates location and lifting capacity of each lifting attachment and location of center of gravity.

2.3 GENERATOR-SET PERFORMANCE

A. Steady-State Voltage Operational Bandwidth: 2 percent of rated output voltage from no load to full load.

B. Steady-State Voltage Modulation Frequency: Less than 1 Hz.

C. Transient Voltage Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Voltage recovers to remain within the steady-state operating band within three seconds.

D. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

E. Steady-State Frequency Stability: When system is operating at any constant load within rated load, there are no random speed variations outside the steady-state operational band and no hunting or surging of speed.

F. Transient Frequency Performance: Less than 3 percent variation for a 50 percent step-load increase or decrease. Frequency recovers to remain within the steady-state operating band within one second.

G. Output Waveform: At no load, harmonic content measured line to line or line to neutral does not exceed 3 percent total and 2 percent for single harmonics. The telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.

H. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, the system will supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to any generator system component.

I. Start Time: Comply with NFPA 110, Type 10, system requirements.

2.4 SERVICE CONDITIONS

A. Environmental Conditions: Engine generator system withstands the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: Minus 30 to plus 40 deg C.

2. Relative Humidity: 0 to 95 percent.
3. Altitude: Sea level to 5500 feet (5358 feet).

2.5 ENGINE

A. Comply with NFPA 37.

B. Rated Engine Speed: 1800 rpm.

C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

D. Lubrication System: Pressurized by a positive-displacement pump driven from engine crankshaft. The following items are mounted on engine or skid:

1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
2. Thermostatic Control Valve: Controls flow in system to maintain optimum oil temperature. Unit is capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps or siphons or special tools or appliances.

2.6 GOVERNOR

A. Type: Adjustable isochronous, with speed sensing.

2.7 ENGINE COOLING SYSTEM

A. Description: Closed loop, liquid cooled, with radiator factory mounted on engine generator-set skid and integral engine-driven coolant pump. Radiator shall be rated for specified coolant.

1. Radiator Core Tubes: Nonferrous-metal construction other than aluminum.
2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
3. Fan: Driven by totally enclosed electric motor with sealed bearings.

B. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.

C. Expansion Tank: Constructed of welded steel plate and equipped with gage glass and petcock.

D. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

E. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.

1. Rating: 50-psig (345-kPa) maximum working pressure with 180 deg F (82 deg C) coolant, and non-collapsible under vacuum.
2. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

2.8 NATURAL GAS FUEL SYSTEM

A. The engine fuel system shall be designed for primary operation on natural gas having a BTU content of 1,000 BTU per cubic foot delivered to the unit in a vapor state. A carburetor, secondary regulator, fuel lock-off solenoid, and all piping shall be installed at the point of manufacturing, terminating at a single pipe opening external to the mounting base.

B. The manufacturer shall supply its recommended flexible fuel line to connect the engine to the external fuel source. For stationary applications, the fuel line shall match the fuel fitting on the unit base rail and have braided stainless steel covering with brass fittings.

C. Mechanical contractor shall be responsible for gaseous fuel piping sized to allow the volume of natural gas required at the generator set. The generator manufacturer shall see mechanical drawings for gas pressure being provided.

2.9 ENGINE EXHAUST SYSTEM

A. Muffler: Critical type, sized as recommended by engine manufacturer. Measured sound level at a distance of 7 meters from exhaust discharge, is 84 dBA or less.

B. Condensate Drain for Muffler: Schedule 40, black steel pipe connected to muffler drain outlet through a petcock.

C. Connections from Engine to Exhaust System: Flexible section of corrugated stainless-steel pipe.

D. Connection from Exhaust Pipe to Muffler: Stainless-steel expansion joint with liners.

2.10 COMBUSTION-AIR-INTAKE

A. Description: Heavy-duty engine-mounted air cleaner with replaceable dry filter element and "blocked filter" indicator.

2.11 STARTING SYSTEM

A. Description: DC battery voltage, with negative ground and including the following items:

1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Environmental Conditions" Paragraph in "Service Conditions" Article above.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified.

4. Cranking Cycle: 60 seconds.
5. Battery: Adequate capacity within ambient temperature range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article above to provide specified cranking cycle at least three times without recharging.
6. Battery Cable: Size as recommended by generator set manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
7. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater is arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article above. Include accessories required to support and fasten batteries in place.
8. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
9. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit complies with UL 1236 and includes the following features:

    a. Operation: Equalizing-charging rate of 10 A is initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit then automatically switches to a lower float-charging mode and continues operating in that mode until battery is discharged again.
    b. Automatic Temperature Compensation: Adjusts float and equalizes voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
    c. Automatic Voltage Regulation: Maintains output voltage constant regardless of input voltage variations up to plus or minus 10 percent.
    d. Ammeter and Voltmeter: Flush mounted in door. Meters indicate charging rates.

2.12 CONTROL AND MONITORING

A. Functional Description: When the mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic-transfer switches initiate starting and stopping of the generator set. When the mode-selector switch is switched to the on position, the generator set manually starts. The off position of the same switch initiates generator-set shutdown. When the generator set is running, specified system or equipment failures or derangements automatically shut down the generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down the generator set.

B. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages are grouped on a common control and monitoring panel mounted on the generator set. Mounting method isolates the control panel from generator-set vibration.

C. Indicating and Protective Devices and Controls: Include those required by NFPA 110 for a Level 1 system, and the following:

D. Indicating and Protective Devices and Controls: Include the following for a Level 1 system:

1. AC voltmeter.
2. AC ammeter.
3. AC frequency meter.
4. DC voltmeter (alternator battery charging).

5. Engine-coolant temperature gage.
6. Engine lubricating-oil pressure gage.
7. Running-time meter.
8. Ammeter-voltmeter, phase-selector switch(es).
9. Generator-voltage adjusting rheostat.
10. Start-stop switch.
11. Lamp test switch.
12. Contacts for local and remote common alarm.
13. Overcrank (fail to start).
14. Low water temperature.
15. High engine temperature pre-alarm.
16. High engine temperature.
17. Low lube oil pressure pre-alarm.
18. Low lube oil pressure.
19. Overspeed.
20. Low coolant level.
21. EPS supplying load.
22. Control switch not in automatic position.
23. High battery voltage.
24. Low cranking voltage.
25. Low voltage in battery.
26. Battery charger AC failure.

E. Supporting Items: Include sensors, transducers, terminals, relays, and other devices, and wiring required to support specified items. Locate sensors and other supporting items on engine, generator, or elsewhere as indicated. Where not indicated, locate to suit manufacturer's standard.

F. Remote Alarm Annunciator: Comply with NFPA 99 and NPFA 110, include the following for a level 1 system. Labeled LEDs identify each alarm event. Common audible signal sounds for alarm conditions. Silencing switch in face of panel silences signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

1. Contacts for local and remote common alarm.
2. Overcrank (fail to start).
3. Low water temperature.
4. High engine temperature pre-alarm.
5. High engine temperature.
6. Low lube oil pressure pre-alarm.
7. Low lube oil pressure.
8. Overspeed.
9. Low coolant level.
10. Control switch not in automatic position.
11. Low cranking voltage.
12. Audible alarm silencing switch.

G. Remote Emergency-Stop Switch: Flush wall-mounted, unless otherwise indicated and prominently labeled. Push button is protected from accidental operation.

2.13 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Generator Circuit Breaker: Molded-case, electronic-trip type, LSIG-GFPE; 100 percent rated; complying with UL 489.

1. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
2. Trip Settings: Matched to generator thermal damage curve as closely as possible.
3. Shunt-Trip: Connected to trip breaker when generator set is shut down by other protective devices.
4. Mounting: Adjacent to or integrated with control and monitoring panel.
5. Auxiliary contact to close when circuit breaker is in the open position.
6. A qualified manufacturer's representative shall set circuit breaker settings in the field to match generator ratings.

B. Load Bank Circuit Breaker: Provide a circuit breaker sized for the full load of the generator for connection to a load bank. Provide cam-lock connections to exterior of enclosure.

1. Tripping Characteristic: Designed specifically for generator protection.
2. Trip Rating: Matched to generator rating.
3. Shunt Trip: Connected to automatic transfer switch auxiliary contact to trip the breaker should the automatic transfer switch require transfer due to power utility failure.
4. Mounting: Adjacent to or integrated with control and monitoring panel.

2.14 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1 and specified performance requirements.

B. Drive: Generator shaft is directly connected to engine shaft. Exciter is rotated integrally with generator rotor.

C. Electrical Insulation: Class H.

D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

E. Construction prevents mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

F. Excitation uses no slip or collector rings, or brushes, and is arranged to sustain generator output under short-circuit conditions as specified.

G. Enclosure: Dripproof.

H. Instrument Transformers: Mounted within generator enclosure.

I. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.

1. Adjusting rheostat on control and monitoring panel provides plus or minus 5 percent adjustment of output- voltage operating band.

J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

K. Subtransient Reactance: 12 percent, maximum.

2.15 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description: Vandal-resistant, weatherproof steel housing, wind resistant up to 100 mph. Multiple panels are lockable and provide adequate access to components requiring maintenance. Panels are removable by one person without tools. Instruments and control are mounted within enclosure. Exhaust muffler is installed on the enclosure.

1. Construction: Galvanized steel, metal-clad, framed with corner posts and bolted to the skid of the generator set.
2. Access Doors: On both sides of the enclosure with open stainless-steel hinges to allow the doors to be removed. Handles will be the "D" style, flush mount and keyed alike.
3. Ventilation: Louvers equipped with insect/rodent screens arranged to permit air circulation while excluding insects and rodents.
4. Air openings shall include combination motorized dampers and fixed louvers sized to allow proper airflow for engine-generator cooling air requirements. The frames and blades shall be manufactured of extruded aluminum and the fronts shall be covered with expanded aluminum bird screen. Motorized dampers are to include bronze iolite pivots and shall spring open automatically upon utility failure and motor close when generator ends its running cycle. Louver/damper assemblies shall be designed to help prevent the entrance of driving snow and rainwater and shall include blade and jamb seals.
5. Load Center: The enclosure shall be equipped with a 60 amp MLO, 208/120 volt single phase load center to provide power for the battery charger, jacket water heater(s), lighting, receptacle, space heater, dampers, etc.. The load center shall be mounted within the enclosure and allow for a single entry point for commercial power supply conduit and wiring by the installing contractor. The placement of this load center shall be shown on the submittal drawings. All internal conduit and wiring to the ancillary equipment within the enclosure shall be supplied within the package and shall be pre-wired by the enclosure manufacturer in accordance with all applicable codes and regulations.
6. Lighting:
   a. Vaporproof ceiling mounted incandescent lights shall be factory installed within the enclosure and be strategically located on all sides of the generator set to illuminate controls and accessible interior. Provide light switch by one of the entry doors and connect to the provided load center for power source.
   b. A factory provided emergency battery powered emergency light fixture shall be provided within the enclosure. Connect to the provided load center for power source.
7. Service Receptacle: Provide a 120V/20A service receptacle adjacent to the light switch within the enclosure. Connect to a dedicated 20A/1P circuit breaker within the provided load center for power source.
8. For NFPA 110, level 1 applications, the manufacturer shall ensure that the ambient temperature within the enclosure shall be capable of being maintained at a minimum of 40ºF while in the non-run status.
   1) Provide a thermostatically controlled space heater within the enclosure as required to meet this requirement. Interlock heater to be off when generator is running.
   2) The walls, roof, and doors shall be lined with insulation matching the wall thickness, complete with 22 gauge galvanized liner installed with pop rivet construction as required to meet this requirement.

9. Sound Attenuation: Design sound levels shall be 78dBA, as measured at a distance of 7 meters around the enclosure in a free field environment. Additional wall and insulation thickness, plus air discharge & intake hoods or sound attenuators shall be installed to meet design sound levels.
10. Where access door panel handles, circuit breakers, or controllers are located more than 78” above finish grade elevations, service catwalk platforms shall be provided.

2.16 FINISHES

A. Outdoor Enclosures: Two-coat enamel over corrosion-resistant pretreatment and compatible standard primer.

2.17 SOURCE QUALITY CONTROL

A. Prototype Testing: Performed on a separate engine generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with those required for Level 1 energy converters in Paragraphs 3.2.1, 3.2.1.1, and 3.2.1.2 of NFPA 110.
2. Generator Tests: Comply with IEEE 115.
3. Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype have been tested to demonstrate compatibility and reliability.

B. Project-Specific Equipment Tests: Factory test engine generator set and other system components and accessories before shipment. Perform tests at rated load and power factor. Include the following tests.

1. Full load run.
2. Maximum power.
3. Voltage regulation.
4. Transient and steady-state governing.
5. Single-step load pickup.
6. Safety shutdown.

C. Observation of Factory Tests: Provide 14 days' advance notice of tests and opportunity for observation of test by Owner's representatives.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, equipment foundations, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Examine roughing-in of cooling-system piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

3.2 CONCRETE BASES

A. Install concrete bases of dimensions indicated for packaged engine generators. Refer to Division 3 Section "Cast-in-Place Concrete" and Division 26 Section "Basic Electrical Materials and Methods."

3.3 INSTALLATION

A. Comply with packaged engine generator manufacturers' written installation and alignment instructions, and with NFPA 110.

B. Set packaged engine generator set on concrete bases.

1. Support generator-set mounting feet on rectangular metal blocks and shims or on metal wedges having small taper, at points near foundation bolts to provide ¾ to 1-1/2 inch gap between pump base and foundation for grouting.
2. Adjust metal supports or wedges until generator is level.

C. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

D. Install remote emergency-stop switch near the main electrical service to the facility unless it is shown at another location on the drawings.

E. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

1. Verify that electrical wiring is installed according to manufacturers' submittal and installation requirements in Division 26 Sections. Proceed with equipment startup only after wiring installation is satisfactory.

3.4 CONNECTIONS

A. Electrical wiring and connections are specified in Division 26 Sections.

B. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 IDENTIFICATION

A. Identify system components according to Division 26 Section “Basic Electrical Materials and Methods”.

B. Provide a sign at the service entrance equipment in accordance with articles 700, 701, and/or 702 of the National Electrical Code.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections, and to assist in testing. Report results in writing.

B. Testing: Perform field quality-control testing under the supervision of the manufacturer's factory-authorized service representative.

C. Tests: Include the following:

1. Tests recommended by manufacturer.
2. InterNational Electrical Testing Association Tests: Perform each visual and mechanical inspection test stated in NETA ATS for emergency engine generator sets, except omit vibration baseline test. Certify compliance with test parameters for tests performed.
3. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, the following:
    a. Single-step full-load pickup test.
4. Full Load Test:
    a. Provide full load test utilizing portable test bank for a period of four hours minimum. Simulate power failure including operation of the associated transfer switch, automatic starting cycle, and automatic shutdown and return to normal power.
    b. Record the following parameters in 20 minute intervals during the four hour load test. Provide results in writing.
        1) Kilowatts.
        2) Amperes.
        3) Voltage.
        4) Coolant Temperature.
        5) Room Temperature.
        6) Frequency.
        7) Oil Pressure.
5. Battery Tests: Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery. Verify acceptance of charge for each element of battery after discharge. Verify measurements are within manufacturer's specifications.
6. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
7. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Test alarm and shutdown circuits by simulating conditions. Check for air, exhaust, and fluid leaks.
8. Exhaust Emissions Test: Comply with applicable government test criteria.

9. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations 10 feet from enclosure, and compare measured levels with required values.

D. Coordinate tests with tests for transfer switches and run them concurrently.

E. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

F. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

G. Test instruments shall have been calibrated within the last 12 months, traceable to standards of the National Institute for Standards and Technology, and adequate for making positive observation of test results. Make calibration records available for examination on request.

3.7 BATTERY EQUALIZATION

A. Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

3.8 CLEANING

A. On completion of installation, inspect system components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators as specified below:

1. Coordinate this training with that for transfer switches. Schedule training with Owner, through Architect, with at least seven days advance notice.
2. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment.
3. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."
4. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
5. Minimum Instruction Period: Four hours.

END OF SECTION 262310

SECTION 262890 – SURGE PROTECTION DEVICES (SPD's)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surge protection devices for low-voltage power, control, and communication equipment.

B. Provide at locations indicated on power riser diagram. Connect to 60A/3P circuit breakers as indicated.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

B. Product Certificates: Signed by manufacturers of surge protection devices, certifying that products furnished comply with the following testing and labeling requirements:

1. UL 1283 certification.
2. UL 1449 listing and classification (third edition).

C. Maintenance Data: For surge protection devices to include in maintenance manuals specified in Division 1.

D. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain surge protection devices and accessories through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Surge protection devices shall be designed in accordance with ANSI/IEEE C62.41.1-2002, C62.41.2-2002, and C62.45-2002.

D. UL Compliance: Comply with Underwriters Laboratories ANSI/UL 1283, 5th Edition - "Electromagnetic Interference Filters" (applies to type 2 SPD's).

E. UL Compliance: Comply with Underwriters Laboratories ANSI/UL 1449 3rd Edition – "Surge Protective Devices".

1.5 PROJECT CONDITIONS

A. Placing into Service: Do not energize or connect service entrance equipment, switchboards, panelboards, control terminals, data terminals, etc. to their sources until the surge protective devices are installed and connected.

B. Service Conditions: Rate surge protective devices for continuous operation under the following conditions, unless otherwise indicated:

1. Maximum Continuous Operating Voltage: Not less than 115 percent of nominal system operating voltage.
2. Operating Temperature: 30 to 120 deg F (0 to 50 deg C).
3. Humidity: 0 to 85 percent, noncondensing.

1.6 COORDINATION

A. Coordinate location of field-mounted surge protectors to allow adequate clearances for maintenance.

1.7 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of surge suppressors that fail in materials or workmanship for a period of not less than ten years from date of shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Manufacturers of a Broad Line of Surge Protection Devices:
   a. Advanced Protection Technologies.
   b. Eaton Corp.; Cutler-Hammer Products.
   c. General Electric.
   d. Intermatic.
   e. Liebert/Emerson.
   f. Square D by Schneider Electric.

2. Manufacturers of Category A and Telephone/Data Line Suppressors:

   a. EDCO (Emerson Network Power Surge Protection).
   b. MCG Electronics, Inc.
   c. NTE Electronics, Inc.
   d. Telebyte Technology, Inc.

2.2 SURGE PROTECTION DEVICES

A. Type 2 SPD's, comply with ANSI/UL 1283.

B. Surge Protective Device Description: Modular type with the following features and accessories:

1. The system shall be designed for easy servicing by a qualified field electrician, providing simple change out of any or all TVSS modules. Designs that require factory service are not acceptable. Any unit using "plug-in" type modules are not acceptable. All connections, conductors, and terminals must be appropriately sized for specified surge current capacity.
2. LED indicator lights for power and protection status.
3. Audible alarm, with silencing switch, to indicate when protection has failed.
4. One set of dry contacts rated at a minimum of 2A and 24Vdc, for remote monitoring of protection status.
5. Redundant suppression circuits.
6. Minimum withstand rating of 20kA per mode.
7. Redundant replaceable modules (if Surge Current Rating is above 200kA per phase).
8. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
9. Surge-event operations counter.

C. Surge Current Rating: 120kA per mode, 240kA per phase.

D. Connection Means: Permanently wired.

E. Protection modes and UL 1449 voltage protection for grounded wye circuits with voltages of 208Y/120 V, three-phase, 4-wire circuits, shall be as follows:

1. Line to Neutral: 800 V.
2. Line to Ground: 800 V.
3. Neutral to Ground: 800 V.
4. Line to Line: 1200V.

F. SCCR: Per NEC 285.6, the short circuit current rating of the SPD shall be equal to or greater than the AIC rating of the associated switchboard or panelboard to which the SPD is being connected

G. Nominal Discharge Current Rating:

1. Surge protective devices must carry a minimum Nominal Discharge Current Rating of 20kA to meet the requirements of UL96A – Installation Requirements for Lightning Protection Systems.

2.3 ENCLOSURES

A. NEMA 250, with type matching the enclosure of panel or device being protected.

PART 3 - EXECUTION

3.1 INSTALLATION OF SURGE PROTECTIVE DEVICES

A. Install devices for panelboard and auxiliary panels with conductors between SPD and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.

1. Provide multi-pole circuit breaker as a dedicated disconnect for the SPD, unless otherwise indicated.

3.2 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. After installing surge protective devices, but before electrical circuitry has been energized, test for compliance with requirements.
2. Complete startup checks according to manufacturer's written instructions.
3. Perform each visual and mechanical inspection test stated in NETA ATS, Section 7.19.

B. Repair or replace malfunctioning units. Retest after repairs or replacements are made.

3.4 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain surge protective devices.

1. Train Owner's maintenance personnel on procedures and schedules for maintaining suppressors.
2. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
3. Schedule training with Owner, through Architect, with at least seven days' advance notice. Provide a minimum of 1 hour of training at each of two sessions.

END OF SECTION 262890

SECTION 264100 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes individually mounted enclosed switches and circuit breakers used for the following:

1. Feeder and branch-circuit protection.
2. Motor and equipment disconnecting means.

1.3 SUBMITTALS

A. Product Data: For each type of switch, circuit breaker, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each switch and circuit breaker.

1. Dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Mark each product data sheet with the tag number and equipment description indicated on the mechanical equipment schedule and/or power riser diagram.
b. Enclosure types and details for types other than NEMA 250, Type 1.
c. Current and voltage ratings.
d. Short-circuit current rating.
e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.

C. Maintenance Data: For enclosed switches and circuit breakers and for components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Closeout Procedures," include the following:

1. Routine maintenance requirements for components.
2. Manufacturer's written instructions for testing and adjusting switches and circuit breakers.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NEMA AB 1 and NEMA KS 1.

C. Comply with NFPA 70.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 110 deg F (43 deg C).
2. Altitude: Not exceeding 1500 feet (450 m).

1.6 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate features, accessories, and functions of each enclosed switch with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Fusible and Non-fusible Switches:

a. Eaton Corp.; Cutler-Hammer Products.
b. General Electric Co.; Electrical Distribution & Control Division.
c. Schneider Electric (Square D Co.)
d. Siemens Energy & Automation, Inc.

2. Molded-Case Circuit Breakers:

    a. Eaton Corp.; Cutler-Hammer Products.
    b. General Electric Co.; Electrical Distribution & Control Division.
    c. Schneider Electric (Square D Co.)
    d. Siemens Energy & Automation, Inc.

2.2 ENCLOSED SWITCHES

A. Enclosed, Non-fusible Switch: NEMA KS 1, Type HD, with lockable handle.

B. Enclosed, Fusible Switch, 1600 A and Smaller: NEMA KS 1, Type HD, with clips to accommodate specified fuses, lockable handle, and interlocked with cover in closed position.

2.3 ENCLOSED CIRCUIT BREAKERS

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits.
2. Adjustable Instantaneous-Trip Circuit Breakers (100A, unless noted otherwise): Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic Trip Unit Circuit Breakers (150A and larger, unless noted otherwise): RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

    a. 100% rated.
    b. Instantaneous trip.
    c. Long- and short-time pickup levels.
    d. Long- and short-time time adjustments.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
5. Auxiliary Switch: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.

2.4 ENCLOSURES

A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
4. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

2.5 FACTORY FINISHES

A. Finish: Manufacturer standard paint applied to factory-assembled and -tested enclosures before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install enclosed switches and circuit breakers in locations as indicated, according to manufacturer’s written instructions. Verify that the installation will be accessible and will provide the clearances as required by the NEC article 110-26.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

C. Mechanical Equipment: Install enclosed switches on vertical building surfaces or provide steel tubing and u-channel support/backboard assembly for mounting enclosed switches. Do not mount enclosed switches directly to mechanical equipment housings.

D. Exterior Enclosures: Mount enclosures at elevations to maximize aesthetics and minimize viewing angles by the public.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Basic Electrical Materials and Methods."

B. Enclosure Nameplates: Label each enclosed switch and circuit breaker with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws. Label shall indicate the equipment being served.

3.4 CONNECTIONS

A. Install equipment grounding connections for switches and circuit breakers with ground continuity to main electrical ground bus.

B. Install power wiring. Install wiring between switches and circuit breakers, and control and indication devices.

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test continuity of each line- and load-side circuit.

B. Testing: After installing enclosed switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection test indicated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3.6 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

3.7 CLEANING

A. On completion of installation, inspect interior and exterior of enclosures. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 264100

SECTION 264150 - TRANSFER SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes transfer switches rated 600V and less, including the following:

1. 600A, 120/208V, 3-Phase, Service-Entrance Rated Automatic Open-Transition 3-Pole Transfer Switch.

1.3 SUBMITTALS

A. Product Data: Include ratings and dimensioned plans, sections, and elevations showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material list.

B. Wiring Diagrams: Detail wiring for transfer switches and differentiate between manufacturer-installed and field-installed wiring. Show both power and control wiring.

C. Single-Line Diagram: Show connections between transfer switch, power sources, and load; and show interlocking provisions for each combined transfer switch.

D. Product Certificates: Signed by manufacturer certifying that products furnished comply with requirements and that switches have been tested for load ratings and short-circuit closing and withstand ratings applicable to units for Project.

E. Maintenance Data: For each type of product to include in maintenance manuals specified in Division 1. Include all features and operating sequences, both automatic and manual. List all factory settings of relays and provide relay-setting and calibration instructions, including software, where applicable.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain a service center capable of providing emergency maintenance and repairs at Project site with an eight-hour maximum response time.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, for emergency service under UL 1008, by a testing agency acceptable to authorities having jurisdiction.

C. Comply with NFPA 70.

D. Comply with NFPA 110.

E. Comply with UL 1008, unless requirements of these Specifications are stricter.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver transfer switch to their final locations in protective wrappings, containers, and other protection that will exclude dirt and moisture and prevent damage from construction operations. Remove protection only after equipment is safe from such hazards.

1.6 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace packaged engine generator and auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years 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. Transfer Switches Using Molded-Case Switches or Circuit Breakers:

a. ASCO.
b. Eaton Corp.; Westinghouse & Cutler-Hammer Products.
c. Hubbell Industrial Controls, Inc.
d. ABB.
e. Generac Corp.
f. Caterpillar, Inc.; Engine Division.
g. Cummins Onan.
h. Kohler Co.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Service-Entrance Rated Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breaker (Load Bank): Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip settings.
2. 100% Rated Electronic Trip Unit Main Circuit Breaker (Building): RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

a. Instantaneous trip.
b. Long- and short-time pickup levels.
c. Long- and short-time time adjustments.

B. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

C. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch AIC ratings cannot be met, provide a fused disconnect switch ahead of the transfer switch to provide required AIC ratings.

D. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels have communications capability matched with remote device.

E. Solid-State Controls: Repetitive accuracy of all settings is plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

F. Resistance to Damage by Voltage Transients: Components meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components meet or exceed voltage-impulse withstand test of NEMA ICS 1.

G. Overlapping Neutral Contacts: Provide overlapping neutral contacts designed to momentarily connect both source neutrals together to the load neutral during the transfer.

H. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6; UL 508, unless otherwise indicated.

I. Factory Wiring: Train and bundle factory wiring and label consistent with Shop Drawings, either by color code or by numbered or lettered wire and cable tape markers at terminations.

1. Designated Terminals: Pressure type suitable for types and sizes of field wiring indicated.
2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.

3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.

J. Electrical Operation: Accomplish by a non-fused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

K. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are acceptable.
2. Switch Action: Double throw; mechanically held in both directions.
3. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units rated 225 A and greater have separate arcing contacts.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.

B. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.

C. Signal-before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 0 to 5 minutes.

D. Transfer Switches Based on Molded-Case-Switch Components: Comply with NEMA AB 1, UL 489, and UL 869A.

E. In-Phase Monitor: Factory-wired, internal relay controls transfer so it occurs only when the two sources are synchronized in phase. Relay compares phase relationship and frequency difference between normal and emergency sources and initiates transfer when both sources are within 15 electrical degrees, and only if transfer can be completed within 60 electrical degrees. Transfer is initiated only if both sources are within 2 Hz of nominal frequency and 70 percent or more of nominal voltage.

F. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Control connection to motor starters is through wiring external to automatic transfer switch. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated. Relay contacts handling motor-control circuit inrush and seal currents are rated for actual currents to be encountered.

G. Programmed Neutral Switch Position: Switch operator has a programmed neutral position arranged to provide a midpoint between the two working switch positions, with an intentional, time-controlled pause at midpoint during transfer. Pause is adjustable from 1 to 30 seconds minimum and factory set for 5 seconds, unless otherwise indicated. Time delay occurs for both transfer directions. Pause is disabled, unless both sources are live.

2.4 AUTOMATIC TRANSFER-SWITCH FEATURES

A. Undervoltage Sensing for Each Phase of Normal Source: Senses low phase-to-ground voltage on each phase. Pickup voltage is adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.

B. Time delay for override of normal-source voltage sensing delays transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.

C. Voltage/Frequency Lockout Relay: Prevents premature transfer to generator set. Pickup voltage is adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency is adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.

D. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes; factory set for 10 minutes. Provides automatic defeat of delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.

E. Test Switch: Simulates normal-source failure.

F. Switch-Position Pilot Lights: Indicate source to which load is connected.

G. Source-Available Indicating Lights: Supervise sources via transfer-switch, normal- and emergency-source sensing circuits.

1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
2. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

H. Unassigned Auxiliary Contacts: Two normally open single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.

I. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.

J. Engine Starting Contacts: One isolated, normally closed and one isolated, normally open, rated 10 A at 32-V dc minimum.

K. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes; factory set for five minutes. Initiates shutdown at remote engine-generator controls after retransfer of load to normal source.

L. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine-generator set and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are

for 30-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

1. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer. Exercise with load as coordinated with the Owner.
2. Push-button programming control with digital display of settings.
3. Integral battery operation of time switch when normal control power is not available

2.5 FINISHES

A. Enclosures: Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.

2.6 SOURCE QUALITY CONTROL

A. Factory Test Components, Assembled Switches, and Associated Equipment: Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Floor-Mounted Switch: Level and anchor unit to floor.

3.2 WIRING TO REMOTE COMPONENTS

A. Provide two interface points with the Building Automation System to indicate when the switch is in the emergency power position and to indicate prior (5 minutes) to when the switch is to transfer back to normal power source.

B. Provide interface with the generator load bank circuit breaker to shunt trip the circuit breaker prior to transferring load to the generator.

C. Match type and number of cables and conductors to control and communications requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Basic Electrical Materials and Methods."

B. Transfer Switch Nameplates: Label each transfer switch with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

1. Each transfer switch label shall indicate the transfer switch name, voltage and phase, ampere rating, short circuit current rating, and where the transfer switch is fed from.

3.4 CONNECTIONS

A. Ground equipment as indicated and as required by NFPA 70.

3.5 FIELD QUALITY CONTROL

A. Testing: Test transfer-switch products by operating them in all modes. Perform tests recommended by manufacturer under the supervision of manufacturer's factory-authorized service representative. Correct deficiencies and report results in writing. Record adjustable relay settings.

B. Testing: Perform the following field quality-control testing under the supervision of the manufacturer's factory-authorized service representative in addition to tests recommended by the manufacturer:

1. Before energizing equipment, after transfer-switch products have been installed:

    a. Check for electrical continuity of circuits and for short circuits.
    b. Inspect for physical damage; proper installation and connection; and integrity of barriers, covers, and safety features.
    c. Verify that manual transfer warnings are properly placed.
    d. Perform manual transfer operation.

2. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    c. Verify time-delay settings.
    d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    e. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for one pole deviating by more than 50 percent from other poles.
    f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown sequence.

C. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

1. Assist in verifying grounding connections and locations and ratings of sensors.
2. Assist in observing reaction of circuit-interrupting devices when simulated fault current is applied at sensors.

D. Coordinate tests with tests of generator plant and run them concurrently.

E. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.6 CLEANING

A. After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.

B. Clean equipment internally, on completion of installation, according to manufacturer's written instructions.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain transfer switches and related equipment as specified below:

1. Coordinate this training with that for generator equipment.
2. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment.
3. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
4. Schedule training with Owner, through Architect, with at least seven days' advance notice.
5. Provide a minimum of four hours of instruction.

END OF SECTION 264150

SECTION 264200 - ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes ac general-purpose controllers rated 600 V and less that are supplied as enclosed units.

1.3 SUBMITTALS

A. Product Data: For each type of enclosed controller. Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, ratings, and finishes.

1. Mark each product data sheet with the tag number and description indicated on the mechanical equipment schedule.

B. Maintenance Data: For enclosed controllers and components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Closeout Procedures," include the following:

1. Routine maintenance requirements for enclosed controllers and all installed components.
2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

C. Load-Current and Overload-Relay Heater List: Compile after motors have been installed and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain, within 100 miles (160 km) of Project site, a service center capable of providing training, parts, and emergency maintenance and repairs.

B. Source Limitations: Obtain enclosed controllers of a single type through one source from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with NFPA 70.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store enclosed controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect enclosed controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.

B. If stored in areas subjected to weather, cover enclosed controllers to protect from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install electric heating of sufficient wattage to prevent condensation.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect at least two days in advance of proposed utility interruptions. Identify extent and duration of utility interruptions.
2. Indicate method of providing temporary utilities.
3. Do not proceed with utility interruptions without Architect's written permission.

1.7 COORDINATION

A. Coordinate layout and installation of enclosed controllers with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

C. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7 Section "Roof Accessories."

D. Coordinate features of enclosed controllers and accessory devices with pilot devices and control circuits to which they connect.

E. Coordinate features, accessories, and functions of each enclosed controller with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Manual and Magnetic Enclosed Controllers:

a. Eaton Corp.; Cutler-Hammer Products.
b. General Electrical Distribution & Control.
c. Rockwell Automation Allen-Bradley Co.; Industrial Control Group.
d. Schneider Electric (Square D Co.)
e. Siemens/Furnas Controls.

2.2 MAGNETIC ENCLOSED CONTROLLERS

A. Description: NEMA ICS 2, Class A, full voltage, non-reversing, across the line, unless otherwise indicated.

B. Control Circuit: 120 V; obtained from integral control power transformer with secondary fuse protection. The control power transformer shall have sufficient capacity to operate connected pilot, indicating and control devices, plus 100 percent spare capacity.

C. Combination Controller: Factory-assembled combination controller and disconnect switch.

1. Fusible Disconnecting Means: NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 947-4-1, as certified by a nationally recognized testing laboratory.
2. Non-fusible Disconnecting Means: NEMA KS 1, heavy-duty, non-fusible switch.
3. Circuit-Breaker Disconnecting Means: NEMA AB 1, motor-circuit protector with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.

D. Overload Relay: Ambient-compensated type with inverse-time-current characteristic and NEMA ICS 2, Class 10 tripping characteristic. Provide with heaters or sensors in each phase matched to nameplate full-load current of specific motor to which they connect and with appropriate adjustment for duty cycle.

E. Adjustable Overload Relay (shall be provided for all starters associated with 3 phase motors rated at 5HP or larger): Solid state, 3 to 1 adjustment for trip current, and protect motor against voltage and current unbalance and phase loss.

2.3 ENCLOSURES

A. Description: Flush- or surface-mounted cabinets as indicated. NEMA 250, Type 1, unless otherwise indicated to comply with environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
3. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

2.4 MANUAL MOTOR CONTROLLERS

A. Fractional Horsepower Manual Starters: NEMA ICS 2; AC general purpose Class A manually operated, 1 or 2 pole, full-voltage controller rated for 1 horsepower, with adjustable one-piece melting alloy type thermal overload unit rated for connected load, and toggle operator, suitable for flush mounting in finished spaces. NEMA 3R lockable controller for exterior locations.

2.5 ACCESSORIES

A. Devices shall be factory installed in controller enclosure, unless otherwise indicated.

B. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.

C. Furnish each controller with red-run and green-off LED type indicating lights, 2 auxiliary M contacts.

D. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.

E. Control Relays: Auxiliary and adjustable time-delay relays.

2.6 FACTORY FINISHES

A. Finish: Manufacturer's standard paint applied to factory-assembled and -tested enclosed controllers before shipping.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Select features of each enclosed controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, drive, and load; and configuration of pilot device and control circuit affecting controller functions.

B. Select horsepower rating of controllers to suit motor controlled.

C. Use fractional horsepower manual controllers for single-phase motors, unless otherwise indicated.

D. Use manual controllers for 3-phase motors up to 5 horsepower not requiring automatic or remote control.

E. Push-Button Stations: In covers of magnetic controllers for manually started motors where indicated, start contact connected in parallel with sealing auxiliary contact for low-voltage protection.

F. Hand-Off-Automatic Selector Switches: Provide in covers of manual and magnetic controllers of motors started and stopped by automatic controls or interlocks with other equipment.

3.2 INSTALLATION

A. Install enclosed controllers in locations as indicated, according to manufacturer’s written instructions. Verify that the installation will be accessible and will provide the clearances as required by the NEC article 110-26.

B. See Division 26 Section "Basic Electrical Materials and Methods" for general installation requirements.

C. Install independently mounted control devices according to manufacturer’s written instructions.

D. Locate controllers within sight of motors controlled, unless otherwise indicated.

E. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Division 26 Section "Basic Electrical Materials and Methods."

F. Mechanical Equipment: Install enclosed controllers on vertical building surfaces or provide steel tubing and u-channel support/backboard assembly for mounting enclosed controllers. Do not mount enclosed controllers directly to mechanical equipment housings.

G. Exterior Enclosures: Mount enclosures at elevations to maximize aesthetics and minimize viewing angles by the public.

H. Install freestanding equipment on concrete bases complying with Division 3 Section "Cast-in-Place Concrete."

I. Enclosed Controller Fuses: Install fuses in each fusible switch. Comply with requirements in Division 26 Section "Fuses."

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Basic Electrical Materials and Methods."

B. Enclosure Nameplates: Label each enclosed controller with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws. Label shall indicate the equipment being served.

3.4 CONTROL WIRING INSTALLATION

A. Install wiring between enclosed controllers according to Division 26 Section "Conductors and Cables."

B. Bundle, train, and support wiring in enclosures.

C. Connect hand-off-automatic switch and other automatic-control devices where applicable.

1. Connect selector switches to bypass only manual- and automatic-control devices that have no safety functions when switch is in hand position.
2. Connect selector switches with enclosed controller circuit in both hand and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.5 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.6 FIELD QUALITY CONTROL

A. Testing: After installing controllers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements. Perform the following field quality-control testing:

1. Perform each visual and mechanical inspection indicated in NETA ATS, Sections 7.5, 7.6, and 7.16.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3.7 CLEANING

A. Clean enclosed controllers internally, on completion of installation, according to manufacturer's written instructions. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

B. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

3.8 STARTUP SERVICE

A. Verify that enclosed controllers are installed and connected according to the Contract Documents.

B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 26 Sections.

C. Complete installation and startup checks according to manufacturer's written instructions.

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain enclosed controllers.

1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
2. Schedule training with Owner, through Architect, with at least seven days' advance notice. Provide a minimum of 1 hour of training at each of two sessions.

END OF SECTION 264200

SECTION 264420 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes load centers and panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600V and less for the following types:

1. Lighting and appliance branch-circuit panelboards.
2. Distribution panelboards.

1.3 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Enclosure types and details for types other than NEMA 250, Type 1.
b. Bus configuration, current, and voltage ratings.
c. Short-circuit current rating of panelboards and overcurrent protective devices.
d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

C. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Contract Closeout," include the following:

1. Panelboard Schedules: For installation in panelboards. Submit final versions.

a. Copies of panelboard schedules shall be provided in the operation and maintenance manuals in case circuit directories in the panelboards are lost.

2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
3. Time-current curves, including selectable ranges for each type of overcurrent protective device.

D. Panelboard Overcurrent Protection Device Arrangement: To the extent possible, coordinate with panelboard supplier for correct arrangement of overcurrent protection devices (OCPD's) within panelboards to match panelboard schedules shown on the electrical drawings. The contractor shall rearrange OCPD's if necessary to match the schedules shown on the electrical drawings.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NEMA PB 1.

C. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

1.6 EXTRA MATERIALS

A. Keys: Four spares of each type of panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

a. Eaton Corp.; Cutler-Hammer Products.

b. General Electric Co.; Electrical Distribution & Control Div.

c. Schneider Electric (Square D Co.)

d. Siemens Energy & Automation, Inc.

2.2 FABRICATION AND FEATURES

A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1, to meet environmental conditions at installed location.

B. Covers:

1. Provide hinged front trim cover with front trim hinged to box with standard circuit breaker access door within hinged trim cover. Provide flush latch with tumbler lock for circuit breaker access door.

C. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

D. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.

E. Bus: Hard-drawn copper, 98 percent conductivity.

F. Main and Neutral Lugs: Mechanical type suitable for use with conductor material.

G. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

H. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

I. Feed-through Lugs: Mechanical type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

2.3 PANELBOARD SHORT-CIRCUIT RATING

A. Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

2.5 DISTRIBUTION PANELBOARDS

A. Doors: Front mounted, except omit in fused-switch panelboards; secured with vault-type latch with tumbler lock; keyed alike.

B. Main Overcurrent Protective Devices: Circuit breaker.

C. Branch overcurrent protective devices shall be one of the following:

1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

2.6 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 200 A and larger.

2. 100% Rated Electronic Trip Unit Main Circuit Breaker: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings for circuit-breaker frame sizes 250 A and larger:

a. Instantaneous trip.

b. Long- and short-time pickup levels.

c. Long- and short-time time adjustments.

3. GFCI Circuit Breakers for Personnel Protection: Single- and two-pole configurations with 5-mA trip sensitivity.

4. GFCI Circuit Breakers for Equipment Protection: Single- and two-pole configurations with 30-mA trip sensitivity.

B. Molded-Case Circuit-Breaker Features and Accessories. Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Mechanical style, suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.

C. Mounting: Surface mount panelboards shall be mounted to ¾" plywood backboards. Paint backboards with two coats of grey fire-retardant paint.

D. Mounting: Plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

E. Circuit Directory: Create a directory to indicate installed circuit loads. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

1. Room names or Owner's room numbers shall be used. Do not use plan room numbers unless approved by the owner.
2. Spare circuit breakers shall be identified as such.

F. Install filler plates in unused spaces.

G. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.

H. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Basic Electrical Materials and Methods."

B. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

1. Lighting and Appliance Panelboards: Each lighting and appliance panelboard label shall indicate the panelboard name, voltage and phase, and where the panel is fed from.

2. Distribution Panelboards: Label each distribution panelboard section and overcurrent protection device (OCPD). Each section label shall indicate distribution panelboard name, section, voltage and phase, and where the panel is fed from. Each OCPD label shall indicate the device being protected.

3.3 CONNECTIONS

A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.

B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

3.4 FIELD QUALITY CONTROL

A. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection test indicated in NETA ATS Section 7.6 for molded-case circuit breakers.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3. Set field-adjustable switches and circuit-breaker trip ranges.

3.5 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 264420

SECTION 264910 - FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes cartridge fuses, rated 600 V and less, for use in switches, panelboards, switchboards, controllers, and motor-control centers; and spare fuse cabinets.

1.3 SUBMITTALS

A. Product Data: Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
2. Let-through current curves for fuses with current-limiting characteristics.
3. Time-current curves, coordination charts and tables, and related data.
4. Fuse size for elevator feeders and elevator disconnect switches.

B. Ambient Temperature Adjustment Information. If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses adjusted.

1. For each adjusted fuse, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
2. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.

C. Maintenance Data: For tripping devices to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Source Limitations: Provide fuses from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NEMA FU 1.

D. Comply with NFPA 70.

1.5 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (4.4 deg C) or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.6 COORDINATION

A. Coordinate fuse ratings with HVAC and refrigeration equipment nameplate limitations of maximum fuse size.

B. Coordinate fuse ratings for Type 2 protection of motor starters, contacts, and overload relays.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Industries, Inc.; Bussmann Div.
2. General Electric Co.; Wiring Devices Div.
3. Gould Shawmut.
4. Tracor, Inc.; Littelfuse, Inc. Subsidiary.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

B. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Motor Branch Circuits: Class RK5 or Class J, dual-element, time-delay.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

A. Install labels indicating fuse replacement information on inside door of each fused switch.

END OF SECTION 264910

SECTION 265119 - LED LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, lamps, ballasts, emergency lighting units, and accessories.

1.3 SUBMITTALS

A. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:

1. Dimensions of fixtures.
2. Certified results of laboratory tests for fixtures and lamps for photometric performance.
3. Emergency lighting unit battery and charger.
4. Types of lamps.

B. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NFPA 70.

C. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

1.5 COORDINATION

A. Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

1.6 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty for Batteries: Written warranty, executed by manufacturer agreeing to replace rechargeable batteries that fail in materials or workmanship within specified warranty period.

1. Special Warranty Period for Batteries: Manufacturer's standard, but not less than 5 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for last four years.

C. Special Warranties for LED drivers: Written warranty, executed by manufacturer agreeing to replace drivers that fail in materials or workmanship within specified warranty period.

1. Special Warranty Period for LED drivers: Five years from date of manufacture, but not less than four years from date of Substantial Completion.

2. Special Warranty Period for Electronic Emergency Ballasts: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Lighting Fixture Schedule.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

A. Metal Parts: Free from burrs, sharp corners, and edges.

B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging. All parts shall be painted after fabrication to facilitate installation, increase efficiency, and inhibit rusting.

C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.

D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 90 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.

1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.
2. Lens Thickness: 0.125 inch (3 mm) minimum, unless greater thickness is indicated.

F. Electromagnetic Interference Filters: Integral to fixture assembly. Provide one filter for each ballast. Suppress conducted electromagnetic interference filters as required by MIL-STD-461.

2.3 LIGHTING FIXTURES

A. See the “Lighting Fixture Schedule” on plans.

1. Upper case letter at fixture outlet symbol or in note on Drawings indicated the fixture type. Lower case letter at fixture symbol indicated switching circuit. Any outlets not specifically labeled shall be equipment with fixture similar to those in rooms used for like purposes.
2. Fixtures requiring plaster frames or other special frames shall be furnished with these frames as required for type of construction. Fixtures requiring additional accessible outlet connection boxes and additional wiring from outlet box to fixture, shall be furnished with this wiring per the N.E.C. and Local Code requirements. Frames of all recessed fixtures shall be tight to the ceiling to eliminate light leaks. Gasketing shall be used to eliminate all light leaks.

2.4 EXIT SIGNS

A. General Requirements: Comply with UL 924 and the following:

1. Sign Colors and Lettering Size: Comply with authorities having jurisdiction.

B. Internally Lighted Signs: As follows:

1. Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum rated lamp life.

2.5 LAMPS

A. Lamps as manufactured by Osram Sylvania, Phillips Lighting, or General Electric.

B. Lighting fixtures shall qualify for utility rebates (www.cee1.org). Coordinate utility rebate process with utility company and owner for applicable items.

C. LED:

1. Interior Selections - Color Temperature: See lighting fixture schedule.

2.6 PONENTS

A. Comply with Division 26 Section "Basic Electrical Materials and Methods," for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

2.7 FINISHES

A. Fixtures: Manufacturer's standard, unless otherwise indicated.

1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects, after fabrication.
2. Metallic Finish: Corrosion resistant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.
   1. Where specific lamp designations are not indicated or specified, lamp fixtures according to manufacturer's recommendations.
   2. Square light fixtures shall be orientated so all light sources run in the same direction in the same room, corridor, or definable space.

B. Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.

   1. For fixtures with a weight greater than 7 lbs per square foot of occupied ceiling space, install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from fixture corners. These rods or wires shall be secured to individual support points directly vertical from attachment point to fixture to the extent possible.
   2. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.
   3. Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.

C. Fire Rated Ceilings:

   1. Lighting fixtures that are not fire rated for the ceiling they are to be installed in shall be provided with a fire rated enclosure. Enclosure shall be suitable for the application as approved by the local Authority Having Jurisdiction (AHJ). Contractor shall review architectural plans to determine which ceilings, if any, are to be constructed as fire rated assemblies and shall include the protection of any and all light fixtures installed in these ceilings in his/her bid.

D. Exit Light Installation in Grid-Type Suspended or Gyp Board Ceilings:

   1. Support electrical boxes firmly to the deck structure utilizing uni-strut or other acceptable means. Fixtures shall not be easily turned or rotated from below.

E. Emergency ballast test switch installation:

   1. Where the test switch is not integral to the fixture housing or reflector, install switch at a location coordinated with the Architect/Engineer, up to 50' away from the emergency ballast location.

F. Emergency Lighting Fixtures: Provide unswitched normal building power to all fixtures provided with generator transfer ballasts (GTD) for local power failure indication. The unswitched power connection shall be from an emergency branch.

3.2 CONNECTIONS

A. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Tests: As follows:

1. Verify normal operation of each fixture after installation.
2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
3. Verify normal transfer to battery source and retransfer to normal.
4. Report results in writing.

C. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

D. Corrosive Fixtures: Replace during warranty period.

3.4 CLEANING AND ADJUSTING

A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

B. Adjust aimable fixtures to provide required light intensities.

END OF SECTION 265119

SECTION 287210 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes fire alarm systems with manual stations, detectors, signal equipment, controls, and devices.

B. Related Sections include the following:

1. Division 8 Section "Hardware" for door closers/holders/smoke detectors, electric door locks, and release devices that interface with fire alarm systems.

2. Division 21 for water flow devices and sprinkler valve-tamper devices.

1.3 DEFINITIONS

A. FACP: Fire alarm control panel.

B. LED: Light-emitting diode.

C. Definitions in NFPA 72 apply to fire alarm terms used in this Section.

1.4 SYSTEM DESCRIPTION

A. General: Non-coded, addressable system with manual and automatic alarm initiation; and multiplexed signal transmission dedicated to fire alarm service only.

B. Wiring Class and Style: Initiating device circuits and signaling line circuits shall be Class B.

1.5 SUBMITTALS, SHOP DRAWINGS & MAINTENANCE MANUALS

A. Submittals shall be provided in accordance with Division 1 and as further described herein.

B. Submittals shall include major equipment material lists, summarizing every item to be provided, by manufacturer, part number, quantity, and include a brief summary of each item. Manufacturer product data sheets, describing each of the major components shall also be provided.

C. Submittals shall be tab divided to aid in identifying the various sections of the submittal.

D. Shop drawings shall include complete floor plan drawings showing device locations, conduit routing, wire and cable quantity and sizes. Functional block diagrams, complete termination diagrams, showing all headend, control and typical field devices, shall also accompany the submittal.

1. Battery: Provide battery sizing calculations for the control panel and each power expander for actual connected loads.
2. Voltage Drop Calculations: Provide voltage drop calculations for all notification circuits.
3. System Operation Description: Detailed description for this Project, including method of operation and supervision of each type of circuit and sequence of operations for manually and automatically initiated system inputs and outputs. Manufacturer standard descriptions for generic systems are not acceptable.

E. Maintenance manuals shall be compiled in accordance with the Division 1, shall include all information provided as part of the original submittal and shall also be updated to include installation notes, manufacturer's manuals, etc. Manuals shall also include:

1. Descriptions of all equipment and normal operating procedures.
2. Final shop drawings, updated to reflect "as-built" accuracy. Include outlets with label ID's, and cable designations and routing information.
3. Field test reports shall be provided, indicating and interpreting test results for compliance with performance requirements of the Project. Provide certificate of completion in compliance with NFPA 72.
4. Maintenance data shall be included for all major pieces of equipment, as per the requirements specified in Division 1.
5. Copy of major equipment manufacturer's standard warranty statements, for future reference and use, should claims need to be submitted.

F. Submissions to Authorities Having Jurisdiction: In addition to distribution requirements for Submittals specified in Division 1 Section "Submittals", make an identical submission (quantity as required by the AHJ) to authorities having jurisdiction. Include copies of annotated Contract Drawings as needed to depict component locations to facilitate review. Resubmit if required to make clarifications or revisions to obtain approval. On receipt of comments from authorities having jurisdiction, submit them to Architect for review.

1.6 QUALITY ASSURANCE

A. Product Quality

1. Equipment described in this Section shall be provided by a company regularly engaged in the design, sale and installation of Fire Alarm Systems. This company shall also have a service organization, trained by the equipment manufacturer and located a reasonable distance from the jobsite, which is capable of maintaining the system once installed. The services of this company shall be retained by the Electrical Contractor to supervise the system design, installation, make final system connections, and perform all tests and balance work required.
2. All basic electronic equipment shall be listed by Underwriter's Laboratories, Inc. for the application and shall be products of manufacturers of established reputation and experience.
3. Obtain fire alarm system components through one source from a single manufacturer.

B. Contractor Qualifications

1. The Installing Contractor shall be a firm specializing in the type of work called out in this specification section and shall, upon request, provide documentation that they have successfully completed at least three other installations of similar size and scope to this installation.
2. Compliance with Local Requirements: Comply with applicable building code, local ordinances and regulations, and requirements of authorities having jurisdiction.
3. Comply with NFPA 72.
4. The Installing Contractor (and any Subcontractors working for the Installing Contractor) shall be licensed, in accordance with local, regional and state authorities having jurisdiction, to complete the work that they are contracted to perform.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Siemens/Cerberus Pyrotronics.
2. Faraday.
3. Gamewell/FCI.
4. Hochiki America Corporation.
5. Notifier; Div. of Pittway Corp.

2.2 FUNCTIONAL DESCRIPTION OF SYSTEM

A. Control of System: By the FACP.

B. System Supervision: Automatically detect and report open circuits, shorts, and grounds of wiring for initiating device, signaling line, and notification-appliance circuits.

C. Priority of Signals: Automatic alarm response functions resulting from an alarm signal from one zone or device are not altered by subsequent alarm, supervisory, or trouble signals. An alarm signal is the highest priority. Supervisory and trouble signals have second- and third-level priority. Higher-priority signals take precedence over signals of lower priority, even when the lower-priority condition occurs first. Annunciate and display all alarm, supervisory, and trouble signals regardless of priority or order received.

D. Noninterference: A signal on one zone shall not prevent the receipt of signals from other zones.

E. System Reset: All zones are manually resettable from the FACP after initiating devices are restored to normal.

F. Transmission to Remote Alarm Receiving Station: Automatically route alarm, supervisory, and trouble signals to a remote alarm station by means of a digital alarm communicator transmitter and telephone lines.

G. Loss of primary power at the FACP initiates a trouble signal at the FACP and the annunciator. An emergency power light is illuminated at both locations when the system is operating on the secondary power supply.

H. Basic Alarm Performance Requirements: Unless otherwise indicated, operation of a manual station, automatic alarm operation of a smoke (duct type smoke detector shall result in either an alarm or a supervisory condition as required by the AHJ) or flame or heat detector, or operation of a sprinkler flow device initiates the following:

1. Notification-appliance operation.
2. Identification at the FACP and the remote annunciator of the device originating the alarm.
3. Transmission of an alarm signal to the remote alarm receiving station.
4. Unlocking of electric door locks in designated egress paths.
5. Release of fire and smoke doors held open by magnetic door holders.
6. Shutdown of fans and other air-handling equipment serving zone where alarm was initiated.
7. Closing of smoke dampers in air ducts of system serving zone where alarm was initiated.
8. Recording of the event in the system memory.

I. Alarm Silencing, System Reset and Indication: Controlled by switches in the FACP and the remote annunciator.

1. Silencing-switch operation halts alarm operation of notification appliances and activates an "alarm silence" light. Display of identity of the alarm zone or device is retained.
2. Subsequent alarm signals from other devices or zones reactivate notification appliances until silencing switch is operated again.
3. When alarm-initiating devices return to normal and system reset switch is operated, notification appliances operate again until alarm silence switch is reset.

J. Sprinkler valve-tamper switch operation initiates the following:

1. A supervisory, audible, and visible "valve-tamper" signal indication at the FACP and the annunciator.
2. Flashing of the device location-indicating light for the device that has operated.
3. Recording of the event in the system memory.
4. Transmission of supervisory signal to remote alarm receiving station.

K. (Where Applicable) Low-air-pressure switch operation on a dry-pipe or pre-action sprinkler system initiates the following:

1. A supervisory, audible, and visible "sprinkler trouble" signal indication at the FACP and the annunciator.
2. Flashing of the device location-indicating light for the device that has operated.
3. Recording of the event in the system memory.
4. Transmission of trouble signal to remote central station.
5. Provide electrical connections to dry system air compressor as required.

L. Removal of an alarm-initiating device or a notification appliance initiates the following:

1. A "trouble" signal indication at the FACP and the annunciator for the device or zone involved.
2. Recording of the event in the system memory.
3. Transmission of trouble signal to remote alarm receiving station.

M. FACP Alphanumeric Display: Plain-English-language descriptions of alarm, supervisory, and trouble events; and addresses and locations of alarm-initiating or supervisory devices originating the report. Display monitoring actions, system and component status, system commands, programming information, and data from the system's historical memory.

2.3 MANUAL PULL STATIONS

A. Description: Fabricated of metal or lexan, and finished in red with molded, raised-letter operating instructions of contrasting color.

1. Double-action mechanism requires two actions, such as a push and a pull, to initiate an alarm. Break glass stations are not acceptable.
2. Station Reset: Key or wrench operated; double pole, double throw; switch rated for the voltage and current at which it operates.
3. Integral Addressable Module: Arranged to communicate manual-station status (normal, alarm, or trouble) to the FACP.

2.4 SMOKE DETECTORS

A. General: Include the following features:

1. Operating Voltage: 24-V dc, nominal.
2. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
3. Plug-in Arrangement: Detector and associated electronic components are mounted in a module that connects in a tamper-resistant manner to a fixed base with a twist-locking plug connection. Terminals in the fixed base accept building wiring.
4. Integral Visual-Indicating Light: LED type. Indicates detector has operated.
5. Sensitivity: Can be tested and adjusted in-place after installation.
6. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

B. Photoelectric Smoke Detectors: Include the following features:

1. Sensor: LED or infrared light source with matching silicon-cell receiver.
2. Detector Sensitivity: Between 2.5 and 3.5 percent/foot (0.008 and 0.011 percent/mm) smoke obscuration when tested according to UL 268A.

C. Duct Smoke Detector: Photoelectric type.

1. Sampling Tube: Design and dimensions as recommended by the manufacturer for the specific duct size, air velocity, and installation conditions where applied.
2. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.5 OTHER DETECTORS

A. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) or rate of rise of temperature that exceeds 15 deg F (8.3 deg C) per minute, unless otherwise indicated.

1. Mounting: Plug-in base, interchangeable with smoke detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

2.6 NOTIFICATION APPLIANCES

A. Description: Equip for mounting as indicated and have screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly.
2. Weatherproof where indicated.
3. Where shown to be ceiling mounted, units shall be listed for ceiling mount application.
4. Devices shall have white finish.

B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Horns produce a sound-pressure level of 90 dB, measured 10 feet (3 m) from the horn.

1. Horn audibility level shall be field selectable to suit conditions.

C. Visible Alarm Devices: Xenon strobe lights listed under UL 1971 with clear or nominal white polycarbonate lens. Mount lens on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.

1. Rated Light Output: As noted on the plans. If candela ratings are not noted on the plans, provide devices with candela ratings as required to provide for required visual notification.
2. Devices shall be synchronized as required by applicable codes.
3. Strobe Leads: Factory connected to screw terminals.

2.7 REMOTE DEVICE LOCATION-REMOTE TEST/INDICATING LIGHTS AND IDENTIFICATION PLATES

A. Description: Remote test station with LED indicating light and remote test key switch near each smoke detector that may not be readily visible. Light is connected to flash when the associated device is in an alarm or trouble mode. Lamp and test switch are flush mounted in a single gang wall plate. A red, laminated, phenolic-resin identification plate at the indicating light identifies, in engraved white letters, device initiating the signal and room where the smoke detector is located.

2.8 MAGNETIC DOOR HOLDERS

A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching door plate.

1. Electromagnet: Requires no more than 3 W to develop 25-lbf (111-N) holding force.
2. Wall-Mounted Units: Flush mounted, unless otherwise indicated. Provide catch plate extensions as required for holding door.
3. Rating: 24-V ac or dc.

B. Material and Finish: Match door hardware.

2.9 CENTRAL FACP

A. Cabinet: Lockable steel enclosure. Arrange interior components so operations required for testing or for normal maintenance of the system are performed from the front of the enclosure. If more than one unit is required to form a complete control panel, fabricate with matching modular unit enclosure to accommodate components and to allow ample gutter space for field wiring and interconnecting panels.

1. Identify each enclosure with an engraved, red, laminated, phenolic-resin nameplate with lettering not less than 1 inch (25 mm) high. Identify individual components and modules within cabinets with permanent labels.
2. Mounting: Surface.

B. Alarm and Supervisory Systems: Separate and independent in the FACP. Alarm-initiating zone boards consist of plug-in cards. Construction requiring removal of field wiring for module replacement is unacceptable.

C. Control Modules: Include types and capacities required to perform all functions of fire alarm systems.

D. Minimum Number of Intelligent Detection Input Points: 150 or 125% of the connected addressable devices, whichever is greater.

E. Indications: Local, visible, and audible signals announce alarm, supervisory, and trouble conditions. Each type of audible alarm has a different sound.

F. Resetting Controls: Prevent the resetting of alarm, supervisory, or trouble signals while the alarm or trouble condition still exists.

G. Alphanumeric Display and System Controls: Arranged for interface between human operator at the FACP and addressable system components, including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Display: Liquid-crystal type, 40 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

H. Instructions: Printed or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.10 REMOTE ANNUNCIATOR

A. Description: Duplicate annunciator functions of the FACP for alarm, supervisory, and trouble indications. Also duplicate manual switching functions of the FACP, including acknowledging, silencing, reset, and test.

1. Mounting: Flush cabinet, NEMA 250, Class 1.

B. Display Type and Functional Performance: Alphanumeric display same as the FACP. Controls with associated LEDs permit acknowledging, silencing, resetting, and testing functions for alarm, supervisory, and trouble signals identical to those in the FACP.

2.11 NOTIFICATION APPLIANCE CIRCUIT POWER EXTENDER PANEL

A. Provide additional panels as required for operation of notification appliances.

1. Panel shall provide synchronization of strobes at a rate of 1Hz and operate horns with a temporal code pattern.
2. Panel shall provide the capability to silence the audible signals, while the strobes continue to flash.
3. Panel shall provide the capability to synchronize multiple notification appliance circuits.

2.12 EMERGENCY POWER SUPPLY

A. General: Components include valve-regulated, recombinant lead acid battery; charger; and an automatic transfer switch.

1. Battery Nominal Life Expectancy: 4 years, minimum.
2. Battery Capacity: Comply with NFPA 72.

B. Battery Charger: Solid-state, fully automatic, variable-charging-rate type. Provide capacity for 150 percent of the connected system load while maintaining batteries at full charge. If batteries are fully discharged, the charger recharges them completely within four hours. Charger output is supervised as part of system power supply supervision.

C. Integral Automatic Transfer Switch: Transfers the load to the battery without loss of signals or status indications when normal power fails.

2.13 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module listed for use in providing a multiplex system address for listed fire and sprinkler alarm-initiating devices with normally open contacts.

2.14 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Listed and labeled under UL 864 and NFPA 72.

B. Functional Performance: Unit receives an alarm, supervisory, or trouble signal from the FACP panel, and automatically captures one or two telephone lines and dials a preset number for a remote central station. When contact is made with the central station(s), the signal is transmitted. The unit supervises up to two telephone lines. Where supervising two lines, if service on either line is interrupted for longer than 45 seconds, the unit initiates a local trouble signal and transmits a signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. When telephone service is restored, unit automatically reports that event to the central station. If service is lost on both telephone lines, the local trouble signal is initiated.

C. Secondary Power: Integral rechargeable battery and automatic charger. Battery capacity is adequate to comply with NFPA 72 requirements.

D. Self Test: Conducted automatically every 24 hours with report transmitted to central station.

2.15 WIRE

A. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation. Sized per manufacturer requirements.

B. Power-Limited Circuits: NFPA 70, Types FPL, FPLR, or FPLP, as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. The installation shall be in accordance with the latest requirements of the NEC, State, and Local Codes, ordinances and regulations of any other governing body having jurisdiction

B. All equipment shall be installed in a neat and workmanlike manner and to the satisfaction of the Project Engineer.

C. Connect the FACP with a disconnect switch with lockable handle or cover.

D. Provide a smoke detector at the FACP and each notification appliance circuit signal power extender panel.

E. Manual Pull Stations: Mount semi-flush in recessed back boxes.

F. Water-Flow Detectors and Valve Supervisory Switches: Connect for each sprinkler valve station required to be supervised.

G. Fire Department Connection: Provide a weatherproof audible/visual notification device at the fire department connection, coordinate location with the fire protection contractor.

H. Ceiling-Mounted Smoke Detectors: Not less than 4 inches (100 mm) from a side wall to the near edge. For exposed solid-joist construction, mount detectors on the bottom of joists. On smooth ceilings, install not more than 30 feet (9 m) apart in any direction.

I. Wall-Mounted Smoke Detectors: At least 4 inches (100 mm), but not more than 12 inches (300 mm), below the ceiling.

J. Smoke Detectors near Air Registers: Install no closer than 36 inches.

K. Duct Smoke Detectors: Comply with manufacturer's written instructions.

1. Verify that each unit is listed for the complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
2. Install sampling tubes so they extend the full width of the duct.

L. Interface with Mechanical HVAC Equipment:

1. Coordinate with the mechanical contractor the zoning of smoke detectors for control of smoke dampers. Provide control outputs and relays for zoned control of smoke dampers as required.
2. Provide alarm output signals and wiring to the building automation system and all HVAC equipment motor starters and/or AFD controllers for fan shutdown upon alarm as required by the International Mechanical Code. Coordinate requirements with mechanical contractor.

M. Wall Mounted Audible Alarm-Indicating Devices: Install with top of device not less than 6 inches (150 mm) below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Combine audible and visible alarms at the same location into a single unit.

N. Wall Mounted Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and with top of device at least 6 inches (150 mm) below the ceiling.

O. Visible Alarm-Indicating Devices in Sleeping Rooms: Install with top of device at least 24 inches below the ceiling.

P. Notification Appliance Circuits: Connected appliance load shall not exceed 80% of the allowable circuit load.

Q. Remote Device Location-Remote Test/Indicating Lights and Identification Plates: Provide for each smoke detector which is not readily visible and locate in public space near the device they monitor.

R. FACP: Mount with tops of cabinets not more than 72 inches (1830 mm) above the finished floor. Wiring splices shall not be made in the control panel enclosure.

S. Annunciator: Install with the top of the panel not more than 72 inches (1830 mm) above the finished floor.

3.2 WIRING INSTALLATION

A. Wiring Method: Install wiring in raceway except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces. All wiring installed underground or underslab shall be wet location listed.

1. Raceway and boxes shall be installed in accordance with Division 26 Section “Raceway and Boxes”.
2. “Free-Air” Cabling techniques are NOT acceptable for this project. All cables shall be in raceway.

B. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by the manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

C. Cable Taps: Use numbered terminal strips in junction, pull and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.

D. Color-Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and a different color-code for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm system junction box covers red in non-public, un-finished spaces, and above accessible ceilings.

E. Risers: Install at least two vertical cable risers to serve the fire alarm system. Separate risers in close proximity to each other with a minimum one-hour-rated wall, so the loss of one riser does not prevent the receipt or transmission of signal from other floors or zones.

F. Wiring to Remote Alarm Transmitting Device: 1-inch (25-mm) conduit between the FACP and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Basic Electrical Materials and Methods."

B. Install instructions frame in a location visible from the FACP.

C. Paint power-supply disconnect switch red and label "FIRE ALARM."

3.4 COORDINATION OF CENTRAL REPORTING

A. Coordinate central reporting requirements and connections with the owner, telephone switch provider, and local utility.

1. Ensure that arriving phone lines intended for connection for fire alarm central station reporting use are properly routed, terminated, and labeled at all points in this building.
2. Where lines are to be “shared” use, wiring shall first route through the fire alarm system dialing equipment and then on to the telephone switch. Wire terminations through line seizure modules are to be made in a manner that ensures capture and use by the fire alarm equipment in an emergency.

3.5 GROUNDING

A. Signal Ground Terminal: Locate at main equipment rack or cabinet. Isolate from power system and equipment grounding.

B. Install grounding electrodes of type, size, location, and quantity as indicated. Comply with installation requirements in Division 26 Section "Grounding."

C. Ground equipment and conductor and cable shields. For audio circuits, minimize, to the greatest extent possible, ground loops, common-mode returns, noise pickup, cross talk, and other impairments. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and connections and to supervise pretesting, testing, and adjustment of the system. Report results in writing.

B. Pretesting: After installation, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the compliance of the system with requirements of Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new ones, and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of acceptance test results.

C. Report of Pretesting: After pretesting is complete, provide a letter certifying the installation is complete and fully operable, including the names and titles of witnesses to preliminary tests.

D. Final Test Notice: Provide a minimum of 10 days' notice in writing when the system is ready for final acceptance testing.

E. Minimum System Tests: Test the system according to procedures outlined in NFPA 72. Minimum required tests are as follows:

1. Verify the absence of unwanted voltages between circuit conductors and ground.
2. Test all conductors for short circuits using an insulation-testing device.
3. With each circuit pair, short circuit at the far end of the circuit and measure the circuit resistance with an ohmmeter. Record the circuit resistance of each circuit on record drawings.
4. Verify that the control unit is in the normal condition as detailed in the manufacturer's operation and maintenance manual.
5. Test initiating and indicating circuits for proper signal transmission under open circuit conditions. One connection each should be opened at not less than 10 percent of initiating and indicating devices. Observe proper signal transmission according to class of wiring used.
6. Test each initiating and indicating device for alarm operation and proper response at the control unit. Test smoke detectors with actual products of combustion.
7. Test the system for all specified functions according to the approved operation and maintenance manual. Systematically initiate specified functional performance items at each station, including making all possible alarm and monitoring initiations and using all communications options. For each item, observe related performance at all devices required to be affected by the item under all system sequences. Observe indicating lights, displays, signal tones, and annunciator indications.
8. Test Both Primary and Secondary Power: Verify by test that the secondary power system is capable of operating the system for the period and in the manner specified.

F. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets Specifications and complies with applicable standards.

G. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Submit log on the satisfactory completion of tests.

H. Tag all equipment, stations, and other components at which tests have been satisfactorily completed.

3.7 CLEANING AND ADJUSTING

A. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and marred finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel as specified below:

1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, adjusting, and maintaining equipment and schedules. Provide a minimum of 4 hours' training.
2. Training Aid: Use the approved final version of the operation and maintenance manual as a training aid.
3. Schedule training with Owner, through Architect/Engineer, with at least seven days advance notice.

3.9 ON-SITE ASSISTANCE

A. Occupancy Adjustments: When requested within one year of date of Substantial Completion, provide on-site assistance in adjusting sound levels, controls, and sensitivities to suit actual occupied conditions. Provide up to two requested visits to Project site for this purpose.

END OF SECTION 287210