April 19, 2024

PROJECT: City of Cottage Grove
Bohemia Park Expansion

ADDENDUM #1

Branch Engineering Inc. Project No. 22-001K

Digitally signed by Damien Gilbert
Date: 2024.04.19 14:07:05 -07'00'

REGISTERED PROFESSIONAL ENGINEER
#62780PE
DIGITALLY SIGNED
OREGON
JULY 13, 2004
DAMIEN GILBERT
EXPIRES: 6/30/2025

The following clarifications and revisions for the above-referenced project are hereby incorporated by addendum to the previously issued bid documents.

Project Manual – Table of Contents – *Revised*: The attached Addendum #1 Project Manual Table of Contents supersedes the previously issued Table of Contents in its entirety.

Project Manual – Section 610 – Description, Measurement and Payment of Bid Items – *Revised*: The attached Addendum #1 Description, Measurement and Payment of Bid Items page 11 supersedes the previously issued page 11 in its entirety.

Project Manual – Section 700 – CSI Specifications – *Addition*: The attached Addendum #1 CSI specifications are in addition to the previously issued Section 700 CSI specifications.

Plans – Sheets A101 and A601 – *Revised*: The attached Plan sheets A101 and A601 supersedes the previously issued plan sheets in their entirety.

Geotechnical Report – *Addition*: The attached Geotechnical Report is included as part of Addendum #1.

Contractor Question – Do you have the Cottage Grove Prequalification form? *Clarification*: Yes, the Contractor Prequalification application can be requested by sending an e-mail to jessicam@branchengineering.com with the project title in the subject line.

Contractor Question – Is fiberglass GatorBar an acceptable substitute for the specified steel reinforcement? *Clarification*: No, GatorBar is not an acceptable substitute.

End of Addendum #1

CITY OF COTTAGE GROVE, OREGON

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46. BIKE RACK EQUIPMENT AND INSTALLATION

The accepted quantities of bike rack equipment and installation will be paid for at the Contract unit price each.

Payment will be payment in full for furnishing and placing all materials, compensation for all labor, materials, furnishing all equipment, and incidentals necessary to complete the work in accordance with the plans and specifications.

No separate or additional payment will be made for bike rack equipment and installation. Payment will be included in payment for the appropriate items which this work requires.

47. WATER TOWER BUILDING (COMPLETE)

Payment for the construction of the Water Tower Building (complete) will be made at the Contract lump sum amount for Bid Item 47.

Payment will be payment in full for furnishing and placing all materials, compensation for all labor, materials, furnishing all equipment, relocation of utilities within the foundation footprints, and incidentals necessary to complete the work in accordance with the plans and specifications.

No separate or additional payment will be made for the equipment, including the LED display board, and installation necessary for the construction of this bid item. Payment will be included in payment for the appropriate items which this work requires.

48. RESTROOM BUILDING (COMPLETE)

Payment for the construction of the Restroom Building (complete) will be made at the Contract lump sum amount for Bid Item 48.

Payment will be payment in full for furnishing and placing all materials, compensation for all labor, materials, furnishing all equipment, and incidentals necessary to complete the work in accordance with the plans and specifications.

No separate or additional payment will be made for the equipment, and installation necessary for the construction of this bid item. Payment will be included in payment for the appropriate items which this work requires.

49. SPLASH PAD PLUMBING AND INSTALLATION OF FEATURES (COMPLETE)

Payment for the construction of the Splash Pad Plumbing and Installation of Features (complete) will be made at the Contract lump sum amount for Bid Item 49.

Payment will be payment in full for the construction and installation of this bid item, furnishing plumbing equipment, reinforcement in the total area of the Splash Pad and footings, compensation for all labor, materials, coordination with the city of Cottage Grove and incidentals necessary to complete the work in accordance with the plans and specifications. Coordination with the City of Cottage Grove to receive the Splash Pad features is incidental to this bid item.

No separate or additional payment will be made for the construction and installation necessary for this bid item. Payment will be included in payment for the appropriate items which this work requires.

CERTIFICATIONS PAGE

Professional of Record Certification(s):

Stamp	I certify the Sections listed below were prepared under my supervision: CSI Sections: 033000, 042000, 055000, 061000, 072100, 073129, 076100, 079005, 081113, 083100, 087100, 092116, 099000, 101400, 101463, 102800, 220000, 220300, 220700, 230000, 260000, 265000, 312316, 312323.
Signature Digitally signed by Ricardo Hernandez	**Structural Design Engineer** Branch Engineering, Inc. 310 5th Street, Springfield, OR 97477 P: 541-746-0637

NOTE: ALL REFERENCES TO DIVISION 01 SHALL BE REPLACED WITH THE APPROPRIATE REFERENCE TO SECTION 400 – GENERAL CONDITIONS & SECTION 500 – STANDARD SPECIFICATIONS.

SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formwork.
2. Reinforcement.
3. Concrete standards.
4. Concrete materials.
5. Admixtures.
6. Curing materials.
7. Accessory materials.
8. Concrete mixture materials.
9. Concrete mixing.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:

1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 RELATED REQUIREMENTS

A. Structural Drawings Notes: Concrete properties and special inspection requirements.

B. Section 07 9005 - Joint Sealers: Sealants for saw cut joints and isolation joints in slabs.

1.4 REFERENCED STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; current adopted version.

B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; current adopted version.

C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; current adopted version.

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; current adopted version.

E. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.

F. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.

G. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; current adopted version.

H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; current adopted version.

I. ASTM C33 - Standard Specification for Concrete Aggregates; current adopted version.

J. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; current adopted version.

K. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; current adopted version.

L. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); current adopted version.

M. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete; current adopted version.

N. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; current adopted version.

O. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; current adopted version.

P. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; current adopted version.

Q. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete; current adopted version.

R. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; current adopted version.

1.5 ACTION SUBMITTALS

A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

B. Manufacturer's Installation Instructions: For concrete accessories, indicate

installation procedures and interface required with adjacent construction.

C. Slab jointing plan.

D. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following:

1. For all materials.

C. Material Test Reports: For the following:

1. For all materials.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified Installer who employs Project personnel, Concrete Flatwork Finisher, and a supervisor who has a minimum of 5 years of experience installing and finishing concrete for similar projects.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Engineer/Engineer.

D. Field Quality-Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Owner will engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. The following information will be included in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and **ACI 301**.

1.10 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with **ACI 301** as follows:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When air temperature has fallen to or is expected to fall below **40 deg F** during the protection period, maintain delivered concrete mixture temperature within the temperature range required by **ACI 301**.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than **35 deg F**, other than reinforcing steel.

B. Hot-Weather Placement: Comply with **ACI 301** and **ACI 305.1**, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed **95 deg F**.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.11 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of

concrete surface.

5. Chamfer: Provide 3/4 inch by 3/4 inch (19 mm x 19 mm) 45 degree fillet on all exposed 90 degree horizontal or vertical outside facing edges, unless noted otherwise.

    a. Do not chamfer slab edges.

2.2 REINFORCEMENT

A. See structural notes on drawings for grade and size of reinforcing steel. All reinforcement shall be ASTM A 615/A 615M.

B. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.3 CONCRETE STANDARDS

A. ACI Publications: Comply with **ACI 301** unless modified by requirements in the Contract Documents.

2.4 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type of admixture from a single source from a single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, Type II, gray.
2. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, portland blast-furnace slag cement.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Fly Ash: ASTM C618, Class C or F.

C. Normal-Weight Aggregates:

1. Coarse Aggregate: ASTM C33/C33M, Class 3M
2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
3. Fine Aggregate: ASTM C33/C33M.

D. Water: Clean and not detrimental to concrete.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.

C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.6 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately **9 oz./sq. yd.** when dry.

B. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F (10 deg C): Black.
b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
c. Ambient Temperature Above 85 deg F (29 deg C): White.

D. Water: Potable water that does not cause staining of the surface.

E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 ACCESSORY MATERIALS

A. Vapor barrier shall have all of the following qualities:

1. Maintain permeance of less than 0.01 Perms [grains/(ft2 · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
2. Other performance criteria:

a. Strength: ASTM E1745 Class A.
b. Thickness: 15 mils minimum

3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1
4. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.

B. Vapor barrier products:

1. Basis of Design: Stego Wrap 15-Mil Vapor Barrier by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.

C. Vapor Barrier Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.

D. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
2. Minimum Compressive Strength at 28 Days: 7,000 psi.

E. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent.

2.8 CONCRETE MIXTURE MATERIALS

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with **ACI 301**.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland or hydraulic cement in concrete assigned to Exposure Class F3 as follows:

1. Fly Ash or Other Pozzolans: 20 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Silica Fume: 10 percent by mass.
4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
2. Use permeability-reducing admixture in concrete mixtures where indicated.

D. Color Pigment: Add color pigment to concrete mixture in accordance with manufacturer's written instructions and to result in hardened concrete color

consistent with approved mockup.

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

B. Project-Site Mixing: Only as approved by Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.

2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

B. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

C. Verify that forms are clean and free of rust before applying release agent.

D. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

E. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
2. Use latex bonding agent only for non-load-bearing applications.

F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. 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.

3.3 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Agency Project Manager not less than 24 hours prior to commencement of placement operations.

D. Ensure reinforcement, inserts, and embedded parts will not be disturbed during concrete placement.

E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.4 SLAB JOINTING

A. Contractor to submit slab joint plan to engineer for review and approval at least 2 weeks prior to slab pour.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

D. Repair underslab vapor retarder damaged during placement of concrete reinforcing.

E. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

F. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 9005 for finish joint sealer requirements.

G. Install joint devices in accordance with manufacturer's instructions.

H. Install construction joint devices in coordination with floor slab pattern placement sequence.

I. Set top to required elevations. Secure to resist movement by wet concrete.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

K. Place concrete continuously between predetermined expansion, control, and construction joints.

L. Do not interrupt successive placement; do not permit cold joints to occur.

M. Saw cut joints within 1 hour after placing. Use 3/16 inch (5 mm) thick blade, cut into 1/4 depth of slab thickness.

N. Screed floors level at perimeter and slope to drains as indicated. Surface flatness maximum 1/4 inch in 10 ft (6mm/3m).

3.5 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. 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.

3.6 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install reglets to receive waterproofing and through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.7 INSTALLATION OF VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than **6 inches**, sealing vapor retarder to concrete.
4. Lap joints **6 inches** and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by **6 inches** on all sides and sealing to vapor retarder.

3.8 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:

1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:

1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include Fluid Applied Flooring.
2. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects. Light broom finish matching existing, where indicated, otherwise steel trowel finish.
3. Exterior Slabs:

a. Broom finish to match existing where there is an abutting existing slab.
b. Light broom finish slabs where there is not an abutting existing slab.

E. Tooled Edge: Provide 1/4 inch (6 mm) radius tooled edge without shiner.

1. Provide 1/4 inch (6 mm) radius tooled edge at all exposed outward facing 90 degree slab edges and where indicated.

3.9 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. 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 7 days.

C. Surfaces Not in Contact with Forms:

1. Slabs and Floors to Receive Finishes: Ensure that curing compounds and other surface coatings are compatible with specified finish material.
2. Initial Curing: Start as soon as free water has disappeared and before surface is dry.
3. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
4. Final Curing: Begin after initial curing but before surface is dry.

a. Curing Compound: Apply two coats at right angles, using application rate recommended by manufacturer.

3.10 INSTALLATION OF JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least **one** month(s).

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least **2 inches** deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.11 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Agency Project Manager and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Agency Project Manager. 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 Agency Project Manager for each individual area.

3.12 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports. See structural drawings for statement of special inspections.

B. Testing Agency: **Owner will engage** a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
2. Testing agency to immediately report to Engineer, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Engineer, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.

C. Delivery Tickets: comply with ASTM C94/C94M.

D. Other Inspections: Contractor shall schedule other inspections required by authority having jurisdiction.

3.13 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION 033000

SECTION 04 2000
UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Concrete Block.

B. Mortar.

C. Reinforcement and Anchorage.

D. Lintels.

E. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.3 REFERENCE STANDARDS

A. TMS402 - Building Code Requirements and TMS602 Specification for Masonry Structures; American Concrete Institute International; currently adopted version.

B. ASTM C476 - Standard Specification for Grout for Masonry; currently adopted version.

C. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete; currently adopted version.

D. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; currently adopted version.

E. IMIAWC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; currently adopted version.

1.4 SUBMITTALS

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

B. Product Data: Provide data for masonry units, mortar, and grout.

C. Samples: Submit 2 samples of each finish and color type of units to illustrate color, texture, and extremes of color range.

D. Samples: Submit 1 sample each of mortar manufacturer's full color palette for selection.

E. Submit 3 samples of selected color for confirmation.

F. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

G. Mock-Up: Construct minimum of 6 feet long by 4 feet high section of wall for approval by Agency Project Manager prior to proceeding with remainder of wall. If appearance does not match that indicated in the Contract Documents to the satisfaction of the Agency, then rebuild until a match is approved. The completed structure shall incorporate mock-up section.

H. Control Joint Plan for review and approval by engineer at least 2 weeks prior to construction of masonry walls.

1.5 QUALITY ASSURANCE

A. Preconstruction Meeting: See Section 01 3000 Administrative Requirements.

B. See structural drawings for special inspection requirements.

C. Comply with provisions of TMS602, except where exceeded by requirements of the contract documents.

1. Maintain one copy of each document on project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Protect masonry units from moisture and as recommended by masonry units manufacturer.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:

1. Sizes: Standard 8 inch (200 mm) deep units with nominal face dimensions as noted below.

a. Nominal sizes as indicated on drawings.

B. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

C. Concrete Block Grade: See drawings structural notes.

D. Moisture-Resistant Admixture:

1. "Dry Block" admixture by Grace Construction Products.
2. Substitutions: See Section 01 6000 - Product Requirements.

E. Concrete Block Pattern & Texture:

1. CMU BLOCK TYPE 1: Standard pattern, ground-face finish.

a. Typical, U.N.O.

2. CMU BLOCK TYPE 2: Standard pattern, split-face finish.

a. Wainscot

F. Concrete Block Color: Standard gray.

1. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

G. Manufacturers:

1. Mutual Materials.
2. Willamette Graystone.
3. Approved Alternate.

2.2 MORTAR MATERIALS

A. Mortar: See drawings structural notes.

B. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C 979.

C. Color: Standard gray.

D. Water: Clean and potable.

E. Moisture-Resistant Admixture:

1. "Dry Block admixture by Grace Construction Products.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.3 REINFORCEMENT AND ANCHORAGE

A. Reinforcing: See drawings structural notes.

2.4 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

1. Manufacturers:

a. Hohmann and Barnard, Inc: www.h-b.com
b. Substitutions: See Section 01 6000 - Product Requirements.

B. Cleaning Solution:

1. Eaco-chem MMD 80.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.5 LINTELS

A. Lintels: As indicated on drawings.

2.6 GROUT MIXES

A. Grout Mixes: See drawings structural notes.

B. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

C. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 - EXECUTION

3.1 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of International Masonry Industry All Weather Council (IMIAWC).

3.2 WET WEATHER REQUIREMENTS

A. Protect masonry from wet weather during construction. Prevent rain from entering open cells or contacting face of the masonry units. Wet weather protection includes, but is not limited to:

1. Cover top of incomplete work subject to falling moisture with coverings extending 24 inches (600 mm) or more down all sides of work at end of day. Leave cover in place until resuming work.

B. Do not construct wall during wet weather, unless under cover and keeping work out of wet for 5 days from day of installation.

3.3 COURSING

A. Establish lines, levels, and ashlar pattern coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:

1. Unit size and color mix and pattern as indicated.
2. Mortar Joints: Concave.

a. Double strike all joints.

3.4 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Interlock intersections and external corners.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. Prevent mortar and grout from entering unreinforced cells. Remove mortar and

grout debris from unreinforced cells prior to installing loose fill insulation.

3.5 REINFORCEMENT AND ANCHORAGE - GENERAL

A. See drawings structural notes.

3.6 LINTELS

A. Align with faces of masonry.

B. Maintain minimum 8 inch bearing on each side of opening.

3.7 CONTROL AND EXPANSION JOINTS

A. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Form expansion joint as detailed.

3.8 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout.

1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

D. Do not build into masonry construction organic materials that are subject to deterioration.

3.9 TOLERANCES

A. Maximum Variation from Unit to Adjacent Unit: 1/16 inch.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft;

1/2 inch in 30 ft.

E. Maximum Variation of Joint Thickness: 1/16 inch in 3 ft.

F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.10 CUTTING AND FITTING

A. Cut and fit items as required. Coordinate with other sections of work to provide correct size, shape, and location.

3.11 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000.

1. Also see structural drawings for special inspection requirements.

3.12 CLEANING

A. Remove excess mortar and mortar droppings.

1. Continuously process through course of work, but no more than 4 hours from placement.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution. Follow manufacturer's written instructions.

D. Use non-metallic tools in cleaning operations.

E. Use cleaning procedures that do not alter the appearance of or damage the masonry units.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Shop fabricated steel items.

1.2 REFERENCE STANDARDS

A. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; currently adopted version.

B. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; currently adopted version.

C. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); currently adopted version.

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; currently adopted version.

E. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; currently adopted version.

1.3 SUBMITTALS

A. See 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' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 - PRODUCTS

2.1 MATERIALS - STEEL

A. See structural drawings for shapes and ASTM specifications.

B. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1.

C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.2 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds, unless noted otherwise.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FINISHES - STEEL

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

2.4 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 - EXECUTION

3.1 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.

D. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.2 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

1.1 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; currently adopted version.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; currently adopted version.

C. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; currently adopted version.

D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); currently adopted version.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. Species: Douglas Fir-Larch, unless otherwise indicated.
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.

2.2 CONSTRUCTION PANELS

A. Roof Sheathing: APA PRP-108, Rated Sheathing, Exterior Exposure Class, and as follows:

1. Span Rating: 24/0.
2. Thickness: As indicated.
3. Face Plys: C-D

2.3 ACCESSORIES

A. Fasteners and Anchors:

1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M

for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

B. Die-Stamped Connectors: Hot dipped galvanized steel, unless noted otherwise on drawings, sized to suit framing conditions.

1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing per ASTM A653/A653M, unless noted otherwise.
2. See structural drawing notes for type and manufacturer. No substitutions.

C. Water-Resistive Barrier (WRB): HydroGap® Self-Adhered Drainable Housewrap as manufactured by Benjamin Obdyke https://benjaminobdyke.com/product-systems/system-air-barrier/ or approved alternate.

2.4 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. 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.

PART 3 - PART 3 EXECUTION

3.1 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.

3.2 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.

3.3 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.4 CLEANING

A. Waste Disposal: Comply with applicable regulations. Haul debris off site to legal disposal facility appropriate for the material. Burning not allowed.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Batt insulation.

B. Foam-plastic board insulation.

1.2 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.3 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 - PRODUCTS

2.1 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.

1. Thermal resistance as indicated.
2. Facing: Manufacturer's standard on one side. Vapor permeability of one perm or less.
3. Manufacturers:

    a. CertainTeed Corporation: www.certainteed.com.
    b. Johns Manville Corporation: www.jm.com.
    c. Owens Corning Corp: www.owenscorning.com.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

3.2 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in exterior ceiling 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.

E. Install with factory applied vapor retarder membrane facing warm side of building spaces.

F. Lap ends and side flanges of membrane over framing members.

G. Staple or nail facing flanges in place at maximum 6 inches on center.

3.3 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 3129
WOOD SHINGLES AND SHAKES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section Includes:

1. Wood roof shingles.
2. Underlayment materials.
3. Ridge vents.
4. Metal flashing and trim.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Wood roof shingles.
2. Underlayment materials.
3. Ridge vents.
4. Metal flashing and trim.

B. Shop Drawings: For metal flashing and trim.

C. Samples: For each exposed product

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in Wood roof shingle installations with a minimum of 5 years of experience.

B. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label wood products for compliance with referenced grading rules.

1.4 WARRANTY

A. Materials Warranty: Manufacturer's warranty administered by CSSB and on CSSB's standard form in which manufacturer agrees to repair or replace CSSB-labeled products that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.

1. Materials Warranty Period: Limited lifetime from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Grading Rules: Provide wood products that comply with CSSB grading rules for products indicated.

1. Identification: Attach a label to each bundle of wood products that identifies manufacturer, type of product, grade, dimensions, and identification mark of grading agency acceptable to authorities having jurisdiction.

2.2 WOOD ROOF SHINGLES

A. Cedar Shingles: Smooth-sawn western red cedar shingles.

1. Grade: **No. 1**, with starter courses of **No. 2**.
2. Size: Manufacturer's Standard similar to **18 inches (457 mm) long; 0.45 inch (11 mm) thick.**

B. Cedar Shingle Ridge Units: Manufactured, smooth-sawn western red cedar caps for ridges and hips of same thickness as shingles, 7 inches (178 mm) wide; beveled, alternately overlapped, and nailed.

1. Grade: No. 1.
2. Length: Match shingle size.

2.3 UNDERLAYMENT MATERIALS

A. Felt: Asphalt-saturated organic felts, nonperforated and complying with the following:

1. ASTM D226/D226M: Type II.

2.4 RIDGE VENTS

A. Pre-manufactured vented ridge cap as specified in Drawings or approved alternate.

1. Minimum net free area: As specified in Drawings.
2. Insect screen integral to ridge cap.

2.5 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D4586/D4586M Type II, asbestos free.

B. Roofing Nails: ASTM F1667, **stainless steel, Type 304 or hot-dip galvanized-steel,** box-type wire nails, sharp pointed, and of sufficient length to penetrate a minimum of 3/4 inch (19 mm) into sheathing or to penetrate through roof sheathing less than 3/4 inch (19 mm) thick.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Underlayment Nails: Aluminum, stainless steel, or hot-dip galvanized-steel wire nails with low-profile metal or plastic caps, 1-inch- (25-mm-) minimum diameter.

1. Provide with minimum 0.035-inch- (0.89-mm-) thick plastic cap; and with minimum 0.083-inch- (2.11-mm-) thick ring shank or 0.091-inch- (2.31-mm-) thick smooth shank of length to penetrate at least 3/4 inch (19 mm) into roof sheathing or to penetrate through roof sheathing less than 3/4 inch (19 mm) thick.

2.6 METAL FLASHING AND TRIM

A. Comply with requirements in Section 07 6100 "SHEET METAL ROOFING."

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item unless otherwise indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION OF WOOD ROOF SHINGLES

A. Install wood roof shingles in accordance with manufacturer's written instructions and recommendations in CSSB's "New Roof Construction Manual" and NRCA's "The NRCA Roofing Manual: Steep-Slope Roofing Systems."

B. Install wood-shingle starter course along lowest roof edge.

1. Install in double layer with joints offset a minimum of 1-1/2 inches (38 mm).

C. Extend 1 inch (25 mm) over fascia.

D. Install first course of wood roof shingles directly over starter course and in continuous circular courses around roof deck. Install second and succeeding courses of wood roof shingles in continuous circular courses around roof deck.

1. Extend 1 inch (25 mm) over rake edge.
2. Offset joints between shingles in succeeding courses a minimum of 1-1/2 inches (38 mm). Do not align vertical joints in alternate courses.
3. Space shingles a minimum of 1/4 inch (6 mm) and a maximum of 3/8 inch (10 mm) apart.
4. Maintain weather exposure of 5-1/2 inches (140 mm) for 18-inch- (457-mm) long shingles.

E. Vented Ridge Cap Units: Install continuous ridge vents over wood roof shingles in accordance with manufacturer's written instructions. Fasten with manufacturer recommended fasteners of sufficient length to penetrate roof sheathing.

3.2 INSTALLATION OF UNDERLAYMENT MATERIALS

A. Comply with underlayment manufacturer's written installation instructions and with recommendations in CSSB's "New Roof Construction Manual" and NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" applicable to products and applications indicated unless more stringent requirements are specified in the Section or indicated on Drawings.

B. Felt: Install on roof deck parallel with and starting at eaves and fasten with underlayment nails.

1. Single-Layer Installation:

a. Lap sides a minimum of 2 inches (51 mm) over underlying course.
b. Lap ends a minimum of 4 inches (102 mm).
c. Stagger end laps between succeeding courses at least 72 inches (1829 mm).

3.3 INSTALLATION OF PEAK VENT

A. As recommended by Manufacturer.

3.4 INSTALLATION OF METAL FLASHING AND TRIM

A. Install metal flashings and other sheet metal to comply with requirements in Section 07 6100 "SHEET METAL ROOFING."

B. Install metal flashings in accordance with recommendations for wood roofing in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems."

END OF SECTION

SECTION 07 6100
SHEET METAL ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Sheet metal roofing, associated flashings, and underlayment.

1.2 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; current adopted edition.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; current adopted edition.

C. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; current adopted edition.

D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; current adopted edition.

1.3 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. Product Data: Provide data on metal types, finishes, characteristics.

D. Sample for Confirmation: Submit 3 - 24 inch (600 mm) long x full panel width samples for confirmation and approval of selected color.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise noted.

B. Installer Qualifications: Company specializing in performing sheet metal roof installations with a minimum of 5 years of experience.

1.5 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty

requirements.

B. Correct defective Work within a 2 year period after Date of Substantial Completion.

C. Defective work includes degradation of metal finish, failure of watertightness or seals, and installation defects.

D. Provide 30 year manufacturer warranty for metal roofing and flashing. Warranty shall include degradation of metal finish and failure of watertightness or seals.

PART 2 - PRODUCTS

2.1 ROOFING

A. Manufacturers

1. MBCI - LokSeam 1 3/4 inch (44mm) high standing seam, 12 inch (400mm) width.
2. AEP Span - Snap-Seam 1 3/4 inch (44 mm) high standing seam, 12 inch (400 mm) width.
3. Bruce & Dana, Inc. - Snap-Lock 1 inch (25 mm) high standing seam, 12 inch (400 mm) width.
4. ASC Building Products – Skyline Roofing 1” high standing seam, 12 inch width.
5. Substitutions – Section for Product Requirements.

2.2 SHEET MATERIALS

A. Pre-Finished Galvanized Steel Sheet: ASTM A653/A653M, with G90/Z275 zinc coating; 24 gage (0.0239 inches) core steel, shop pre-coated with PVDF (polyvinylidene fluoride) coating; color as selected.

2.3 ACCESSORIES

A. Fasteners: Concealed fastening system standard for roofing manufacturer and to the maximum extent for other sheet metal work. Where exposed fasteners are the only alternative, or are indicated, use fasteners of same material and finish as roofing metal, with soft neoprene washers.

B. Underlayment: ASTM D226, organic roofing felt, Type II ("No.30").

C. Backer Rod: 0.25 inches (6 mm) diameter continuous extruded foam backer rod.

D. Closure Strips: As recommended by roofing manufacturer and as indicated.

2.4 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet, same gage as roofing sheet.

C. Fabricate starter strips, interlockable with sheet.

D. Form pieces in longest practical lengths.

E. Hem exposed edges on underside 1/2 inch; miter and seam corners.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

2.5 FACTORY FINISHING

A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

B. Color: As selected by Owner from Manufacturer's full range of standard colors.

PART 3 - EXECUTION

3.1 INSTALLATION - ROOFING

A. Apply underlayment over entire roof area. Cut as required at vent openings.

B. Cleat and seam all joints.

C. Use plastic cement for joints between metal and bitumen and for joints between metal and felts.

3.2 INSTALLATION - STANDING SEAM ROOFING

A. Install in accordance with manufacturer's written instructions.

B. Place backer rod under center of each panel if required by Agency to prevent "oil-canning". Each length shall be continuous parallel to the slope of the roof and length of the panel.

C. Panels shall be continuous for full length (ridge to fascia) without transverse seams.

D. At eaves and gable ends, terminate roofing by hooking over edge strip.

E. Bend up one side edge 1-1/2 inches and other edge 1-3/4 inches.

F. Make first fold 1/4 inch wide single fold and second fold 1/2 inch wide, providing locked portion of standing seam, 5 plies in thickness.

G. Fold lower ends of seams at eaves over at 45 degree angle

H. Install closure strips where detailed and in accordance with roofing manufacturer's instructions and details for permanent and water-tight construction set in sealant on all contact surfaces.

3.3 INSTALLATION - FLASHINGS

A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

B. Cleat and seam all joints.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Seal metal joints watertight.

END OF SECTION

SECTION 07 9005
JOINT SEALERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Sealants and joint backing.

B. Foam (Closed-Cell).

1.2 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; current adopted edition.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; current adopted edition. C. ASTM D1667 - Standard Specification for Flexible Cellular Materials--Poly(Vinyl Chloride)

1.3 SUBMITTALS

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

B. Product Data: Provide data indicating sealant chemical characteristics.

C. Samples: Submit two samples, 1/4 x 2 inch in size illustrating sealant colors for selection.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section with a minimum of two years' experience.

1.5 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.6 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 which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.1 SEALANTS

A. General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component.

1. Applications: Use for:

a. Control, expansion, and soft joints in masonry.
b. Joints between concrete and other materials.
c. Joints between metal frames and other materials.
d. Other exterior joints for which no other sealant is indicated.

B. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, non-drying, non-skinning, non-curing.

1. Applications: Use for:

a. Concealed sealant bead in sheet metal work.
b. Under thresholds.

C. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.

1. Color: Standard colors matching finished surfaces.
2. Applications: Use for:

a. Interior wall and ceiling control joints.
b. Joints between door and window frames and wall surfaces.
c. Other interior joints for which no other type of sealant is indicated.

D. Bathtub/Tile Sealant: Clear silicone; ASTM C 920, Uses I, M and A; single component, mildew resistant.

E. Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.

1. Color: Gray.
2. Product: Vulkem 45 manufactured by Tremco.

a. Applications:

1) Expansion Joint between building wall and sidewalk at building perimeter.

3. Substitutions: See Section 01 6000 - Product Requirements.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

C. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

C. Verify that joint type, materials and sealants are compatible and as recommended by sealant manufacturer. Notify Agency Project Manager if sealant, other than those specified, is required. Provide product data justifying use of the sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.3 INSTALLATION

A. Apply sealants where indicated and were necessary for weathertightness and waterproofness on both exterior and interior surfaces.

B. Apply sealants where indicated and where appropriate to enhance sanitary maintenance.

C. Use sealants recommended by the manufacturer for the specific application.

D. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

E. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.

F. Install bond breaker where joint backing is not used.

G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

I. Tool joints concave.

J. Apply masonry sand to sealant at expansion/movement joints in masonry to simulate mortar joint.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Protect sealants until cured.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 - NOT USED

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Steel Doors and Frames:

1. Assa Abloy Ceco, Curries, or Fleming: www.assaabloydss.com.
2. Republic Doors: www.republicdoor.com.
3. Steelcraft; Product B14: www.steelcraft.com.

    a. Steelcraft product is the standard of quality to be matched by any other manufacturer.

4. Substitutions: See administrative section for substitutions and product requirements.

2.2 DOORS AND FRAMES

A. Requirements for All Doors and Frames:

1. Door Top Closures: Flush with top of faces and edges.
2. Door Texture: Smooth faces.
3. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
4. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
5. Finish: Factory primed, for field finishing.

2.3 STEEL DOORS

A. Exterior Doors:

1. Grade: ANSI A250.8 Level 4, physical performance Level A, Model 2, seamless.
2. Core: Steel stiffeners and insulation.

    a. Manufacturer's standard insulation.

3. Top Closures: Flush with top of faces and edges.
4. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with

manufacturer's standard coating thickness.
5. Insulating Value: U-value per Drawings, when tested in accordance with ASTM C1363.
6. Weatherstripping: Separate, see Section 08 7100.

B. Interior Doors:

1. Same as exterior doors.

2.4 STEEL FRAMES

A. General:

1. Comply with the requirements of grade specified for corresponding door, except:

a. ANSI A250.8 Level 4 Doors: 12 gage frames.

2. Reinforcing: Add reinforcing as indicated in the drawings.
3. Finish: Same as for door.
4. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
5. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

B. Exterior Door Frames: Fully welded.

1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
2. Finish: Factory primed, for field finishing.
3. Weatherstripping: Separate, see Section 08 7100.

2.5 ACCESSORY MATERIALS

A. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

B. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

2.6 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

PART 3 - NOT USED

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Attic access door and frame units.

B. Access door and frame for storage area.

1.2 RELATED REQUIREMENTS

A. Plumbing, Mechanical, and Electrical sections for plumbing, mechanical and electrical related access panels.

1.3 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

PART 2 - PRODUCTS

2.1 ACCESS DOOR AND PANEL APPLICATIONS - WALL AND CEILING UNITS

A. Manufacturers:

1. Acudor Products Inc; Product UF-5000 24 x 36 SCPC: www.acudor.com.
2. Karp Associates, Inc; Product DSC-214M: www.karpinc.com.
3. Milcor by Commercial Products Group of Hart & Cooley, Inc; Product Architectural Grade Flush Door - Style M: www.milcorinc.com.
4. Versa-Steel, Inc. – Custom Order Access Door.
5. Qualified Custom Fabricator, as approved.
6. Substitutions: See Section 01 6000 - Product Requirements.

B. Access Doors: Factory fabricated door and frame units, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies that units are to be installed in.

1. Door Style: Single thickness with rolled or turned in edges.
2. Material: Steel.
3. Steel Finish: Primed.
4. Primed Finish: Polyester powder coat; manufacturer's standard color.
5. Sizes:

a. Ceilings: 24 x 36 inches.
b. Other: as dimensioned per Drawings.

6. Hardware:

a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
b. Latch/Lock: Screwdriver slot for quarter turn cam latch for spaces with no public access. Keyed lock for spaces with public access.

7. Prime coat with alkyd primer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings. Secure rigidly in place.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Hardware for hollow steel and steel doors.

B. Thresholds.

C. Weatherstripping, seals and door gaskets.

1.2 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

1.3 REFERENCE STANDARDS

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; current adopted edition.

B. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.; current adopted edition (ANSI/BHMA A156.4).

C. BHMA A156.5 - American National Standard for Auxiliary Locks & Associated Products; Builders Hardware Manufacturers Association; current adopted edition (ANSI/BHMA A156.5).

D. BHMA A156.6 - American National Standard for Architectural Door Trim; Builders Hardware Manufacturers Association; current adopted edition (ANSI/BHMA A156.6).

E. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.; current adopted edition (ANSI/BHMA A156.8).

F. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association; current adopted edition (ANSI/BHMA A156.22).

G. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; current adopted edition.

H. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; current adopted edition.

I. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current adopted edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

1.5 SUBMITTALS

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

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Shop Drawings:

1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts.

D. Samples: Prior to preparation of hardware schedule:

1. Submit 1 sample of lockset illustrating style, color, and finish.
2. Samples will be returned to the supplier.

E. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.

F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

G. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Agency's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with a minimum of three years of documented experience.

B. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with 3 years of experience.

1. Supplier must be factory direct and have an AHC (Architectural Hardware Consultant) on staff.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door

opening code to match hardware schedule.

1.8 COORDINATION

A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.9 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five-year warranty for locksets, and 10 year warranty for door closers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - BASIS OF DESIGN

A. Refer to Hardware Schedule in Contract Drawings.

B. Substitutions: See administrative section & Product Requirements.

2.2 DOOR HARDWARE - GENERAL

A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide all items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:

1. Applicable provisions of federal, state, and local codes.
2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
3. Fire-Rated Doors: NFPA 80.
4. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.

D. Function: Lock and latch function numbers and descriptions of manufacturers' series as listed in hardware schedule.

E. Finishes: Identified in schedule.

F. All exposed hardware installation fasteners shall be Torx Plus Pin type vandal resistant.

2.3 HINGES

A. Hinges: Identified in schedule.

B. Manufacturers – Identified in schedule.

2.4 PUSH/PULLS

A. Privacy Indicator: Schlage

1. Schlage Locksets, type as identified in schedule, 2-3/4 inch backset, complete with templates and box strike.

B. Push/Pulls: Comply with BHMA A156.6.

1. Provide push and pull on doors not specified to have lockset, latchset, exit device, or auxiliary lock.
2. On solid doors, provide matching push plate and pull plate on opposite faces.

C. Manufacturers – Identified in schedule.

2.5 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.

1. Hardware Sets indicate locking functions required for each door.
2. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
3. Lock Cylinders: Provide key access on the outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.

1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Agency to provide Medeco final cores and keys. All locks to be compatible with Medeco core and key systems.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.6 AUXILIARY LOCKS

A. Locking Functions: As defined in BHMA A156.5, and as follows:

1. Deadbolt with Thumbturn: Schlage L460T.

B. Manufacturers - Auxiliary Locks: Same as other locks.

2.7 CLOSERS

A. Closers: Identified in schedule

B. Closers: Complying with BHMA A156.4.

C. Manufacturers – Identified in schedule.

2.8 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.

1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

B. Manufacturers - Identified in schedule.

2.9 GASKETING AND THRESHOLDS

A. Gasketing and Thresholds: Identified in schedule.

B. Gaskets: Complying with BHMA A156.22.

1. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.

    a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.

2. On each exterior door, provide door bottom sweep, unless otherwise indicated.

C. Thresholds:

1. At each exterior door, provide a threshold unless otherwise indicated.
2. Field cut threshold to frame for tight fit.

D. Fasteners At Exterior Locations: Non-corroding.

2.10 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS

A. Provide products that comply with the following:

1. Applicable provisions of Federal, State, and local codes.
2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.

B. Finishes: Identified in schedule.

2.11 KEYING

A. Door Locks: Agency provides final core and keying.

1. Include construction keying and provide six (6) construction keys.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. All exposed hardware installation fasteners shall be Torx Plus Pin type vandal resistant.

D. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.

E. Mounting heights for hardware from finished floor to center line of hardware item:

1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."

3.3 ADJUSTING

A. Adjust hardware for smooth operation.

B. Adjust hardware for ADA-compliant operation.

3.4 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.5 PROTECTION

A. Protect finished Work under provisions of Section 01 7000.

B. Do not permit adjacent work to damage hardware or finish.

3.6 SCHEDULE – SEE DRAWINGS

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Gypsum wallboard.

B. Joint treatment and accessories.

1.2 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; current adopted edition.

B. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; current adopted edition.

C. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; current adopted edition.

D. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; current adopted edition.

E. ASTM C1396/C1396M - Standard Specification for Gypsum Board; current adopted edition.

F. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; current adopted edition.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of experience.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.2 BOARD MATERIALS

A. 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: 1/2 inch.
    b. Ceiling Surfaces: 5/8 inch.

2.3 ACCESSORIES

A. Finishing Accessories: ASTM C1047, rolled zinc or rigid plastic, unless otherwise indicated.

1. Types: As detailed or required for finished appearance.

B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.

1. Ready-mixed vinyl-based joint compound.

C. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.2 INSTALLATION OF TRIM AND ACCESSORIES

A. Corner Beads: Install at external corners, using longest practical lengths.

B. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

1. Exception: Where gypsum board edge is concealed by other trim.

3.3 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.

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. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.4 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 9000
PAINTING AND COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and stains.

C. Surfaces to be finished are indicated in this section and on the Drawings.

1.2 REFERENCE STANDARDS

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current adopted edition, www.paintinfo.com.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Master Painters and Decorators Association; current adopted edition.

1.3 SUBMITTALS

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

B. Product Data: Provide complete list of all products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. MPI product number (e.g. MPI #47).
3. Cross-reference to specified paint system(s) product is to be used in; include description of each system (copy of relevant MPI Manual page is acceptable).

C. Samples for Selection:

1. Submit two sets of stain manufacturer's standard color samples on wood substrate for selection.

D. Samples for Confirmation:

1. Submit three samples on wood of each product, species and texture to receive stain for confirmation and approval of selected color.

E. Samples: Submit three paper "drop" samples, 6 x 8 inches in size, illustrating the range of colors available for each finishing product specified.

1. Where the sheen is specified, submit samples in only that sheen.

2. Not applicable to stain samples.

1.4 QUALITY ASSURANCE

A. Material Safety Data Sheets: At project site maintain file of MSDS sheets for each product used; become familiar with and follow manufacturer's stated application and safety requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.6 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

1.7 EXTRA MATERIALS

A. See Section 01 6000 - Product Requirements, for additional provisions.

B. Supply 1 gallon of each color; store where directed.

C. Label each container with color in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Paints and Coatings: Any manufacturer listed in MPI Approved Products List (at www.paintinfo.com) under applicable MPI product reference number, unless otherwise indicated.

B. Provide all paint and coating products used in any individual system from the same manufacturer, no exceptions.

C. Where a paint is not specified for a specific material, provide the paint system appropriate for the material.

2.2 MATERIALS - GENERAL

A. Paints and Coatings: Provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI Categories, except as otherwise indicated.

1. Provide ready-mixed paints and coatings.
2. Provide materials that are compatible with one another, and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 PAINT SYSTEMS

A. Exterior Latex Paint: Water-based, pigmented emulsion coating formulated for alkali, mold, microbial, and water resistance and for use on exterior surfaces, such as masonry, Portland cement plaster, and primed wood and metal.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Benjamin Moore & Co.
    b. Rodda Paint Co.
    c. Sherwin-Williams Company (The)

2. Gloss Level: Manufacturer's standard semigloss or satin finish, as approved by Owner.
3. Color: As selected by Owner from manufacturer’s full range.

B. Interior Latex Paint: Pigmented, water-based paint formulated for alkali, mold, microbial, and water resistance for use on primed/sealed masonry and gypsum board, and on primed wood and metals.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Benjamin Moore & Co.
    b. Rodda Paint Co.
    c. Sherwin-Williams Company (The)

2. Gloss and Sheen Level: Manufacturer's standard semigloss or satin finish, as approved by Owner.
3. Applications include but may not be limited to:

    a. Interior CMU walls.
    b. Gypsum board ceiling.

4. Color: As selected by Owner from manufacturer’s full range.

C. Structural Steel and Metal Fabrications [Exposed to View] - Exterior Alkyd Enamel: Solvent-based, pigmented, alkyd enamel formulated for mold, microbial, and water resistance and for use on exterior, primed, metal surfaces.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Benjamin Moore & Co.
   b. Rodda Paint Co.
   c. Sherwin-Williams Company (The)

2. Gloss Level: Manufacturer's standard semigloss or satin finish, as approved by Owner.
3. Applications include but may not be limited to:

   a. Water Tower Columns.
   b. Water Tower Stave Rings and Fasteners.
   c. LED display connection angles.

4. Fineness of Grind: Manufacturer's standard.
5. Color: As selected by Owner from manufacturer’s full range.

D. Structural Steel and Metal Fabrications [Not Exposed to View or Where Finish Coating is Exterior Latex Paint]:

1. Applications include doors, frames, and louvers, window frames, gates, structural and miscellaneous steel.
2. Alkyd Metal Primer MPI #79, Alkyd MPI #9 with MPI VOC Range of below 25.
3. Applications include but may not be limited to:

   a. Doors
   b. Frames
   c. Louvers

4. Color: Tint to match finish coat.

E. Lumber, Decking, and Wood Trim – Exterior and Interior exposed to public view:

1. Transparent Oil-Base Waterproofing Wood Finish: MPI #13.

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Cabot Products Group.
   b. Heritage Natural Finishes.

3. Applications include but may not be limited to:

   a. Wood siding, ceilings, and soffits.

4. Color: Clear or as selected by Owner from manufacturer's full range.

   a. Water tower siding only – Semi-Transparent Dark Stain and Waterproofing Wood Finish.

F. Gypsum Board:

1. Latex: Latex Primer Sealer MPI #50, Latex Semi-gloss.

2.4 EXTERIOR DOOR FILM

A. 3M 2000 Surface Protection Film

1. Available Suppliers for indicated product include but are not limited to:

   a. Waxie Sanitary Supply.

2.5 ANTI-GRAFFITI COATING

A. Anti-Graffiti Coating shall be a two-component, hydrophobic polyurethane that provides excellent graffiti resistance, color and gloss retention.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Benjamin Moore & Co.
   b. Rodda Paint Co.
   c. Sherwin-Williams Company (The)

2. Applications include but may not be limited to:

   a. Painted interior and exterior surfaces with public access.

PART 3 - EXECUTION

3.1 SCOPE -- SURFACES TO BE FINISHED

A. Paint all exposed surfaces except where indicated not to be painted or to remain

natural; the term "exposed" includes areas visible through permanent and built-in fixtures when they are in place.

B. Paint the surfaces described in PART 2, indicated on the Drawings, and as follows:

1. If a surface, material, or item is not specifically mentioned, paint in the same manner as similar surfaces, materials, or items, regardless of whether colors are indicated or not.
2. Paint surfaces behind movable equipment and furnishings the same as similar exposed surfaces.
3. Paint surfaces to be concealed behind permanently installed fixtures, equipment, and furnishings, using primer only, prior to installation of the permanent item.
4. Finish top, bottom, and side edges of exterior doors the same as exposed faces.
5. Paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment occurring in finished areas to match background surfaces, unless otherwise indicated.

    a. "Finished areas" are the two restroom areas. The Utility area is unfinished.

6. Paint all mechanical and electrical equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
7. Paint shop-primed mechanical and electrical items occurring in finished areas.
8. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Do Not Paint or Finish the Following Items:

1. Items fully factory-finished unless specifically noted; factory-primed items are not considered factory-finished.
2. Items indicated to receive other finish.
3. Items indicated to remain naturally finished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Concealed piping, ductwork, and conduit.

D. Apply Surface Protection Film to inside face of exterior doors after painting but before hanging or installing door hardware.

3.2 EXAMINATION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work.

Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials; report incompatible primer conditions and submit recommended changes for Agency Project Manager's approval.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Concrete, and Concrete Unit Masonry: As directed by coating manufacturer.
2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

E. Measure the ph factor of concrete, masonry, and mortar before starting any finishing process, using the method specified in MPI Architectural Painting Manual.

1. Report results in writing to Agency Project Manager before starting work.
2. If results of tests indicate a need for remedial action, provide written description of remedial action. If a different primer or paint system is required, state the total cost of the change. Do not proceed with remedial action or change without receiving written authorization from Agency Project Manager.

3.3 PREPARATION

A. Prepare surfaces as specified in MPI Architectural Painting Specification Manual and as follows for the applicable surface and coating; if multiple preparation treatments are specified, use as many as necessary for best results; where the Manual references external standards for preparation (e.g. SSPC standards), prepare as specified in those standards; comply with coating manufacturer's specific preparation methods or treatments, if any.

B. Coordinate painting work with cleaning and preparation work so that dust and other contaminants do not fall on newly painted, wet surfaces.

C. Surface Appurtenances: Prior to preparing surfaces or finishing, remove electrical plates, hardware, light fixtures, light fixture trim, escutcheons, machined surfaces, fittings, and similar items already installed that are not to be painted.

1. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before preparation and finishing.
2. After completing painting in each space or area, reinstall items removed using workers skilled in the trades involved.

D. Surfaces: Correct defects and clean surfaces which affect work of this section.

E. Concrete, Cement Plaster and Unit Masonry Surfaces to be Painted: Remove

dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

G. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

H. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

I. Wood to Receive Semi-Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.

3.4 APPLICATION

A. Apply products in accordance with manufacturer's instructions and as specified or recommended by MPI Manual, using the preparation, products, sheens, textures, and colors as indicated.

1. Remove, refinish, or repaint work not complying with requirements.

B. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film; do not apply finishes to surfaces that are not dry.

C. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.

1. Brush Application: Use brushes best suited for the type of material applied; use brush of appropriate size for the surface or item being painted; produce results free of visible brush marks.

a. Not for use on doors and door frames.

2. Roller Application: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

a. Not for use on doors and door frames.

3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
4. Where application method is listed in the MPI Manual for the paint system that application method is required; otherwise, any application method recommended by manufacturer for material used and objects to be painted is acceptable.

    a. Exception: Doors and door frames.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.

1. Number of coats and film thickness required are the same regardless of application method.

    a. Minimum Coats: One coat of primer; two coats of finish paint.

2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
3. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

E. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.

1. Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.
2. Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
3. Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.
4. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
5. If manufacturer's instructions recommend sanding to produce a smooth, even surface, sand between coats.
6. Before applying next coat vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.5 CLEANING AND PROTECTION

A. Collect waste material which may constitute a fire hazard, place in closed metal

containers, and remove daily from site.

B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from site.

C. Protect other work, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting as approved by Agency Project Manager.

D. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in MPI Manual.

END OF SECTION

SECTION 10 1400
SIGNAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Restroom identification signs.

1.2 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current adopted edition; (ADA Standards for Accessible Design).

B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; current adopted edition.

C. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; current adopted edition.

1.3 SUBMITTALS

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

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Design: Submit design of each sign type with all color and copy shown, for approval.

D. Verification Samples: Submit full size samples in proposed materials, colors and copy exactly as proposed for each sign type.

E. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

PART 2 - PRODUCTS

2.1 SIGNAGE APPLICATIONS

A. Accessibility Compliance: All signs are required to comply with ADA Standards for Accessible Design and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

2.2 SIGN TYPES

A. Flat Signs: Signage media without frame.

1. Edges: Square.
2. Corners: Square.
3. Materials:

a. Vandal-resistant and UV-resistant two layered laminated plastic.
b. 1 inch (25 mm) high letters.
c. 1/32 inch (.75 mm) raised copy and border.
d. Grade 2 braille under the lettering.

4. Wall Mounting of One-Sided Signs: As recommended by sign manufacturer for vandal-resistant permanent exterior mounting without exposed fasteners.

B. Color and Font: Unless otherwise indicated:

1. Character Font: Helvetica, Arial, or other sans serif font.
2. Character Case: Upper case only.
3. Background Color: Dark Blue.
4. Character Color: White color.

C. Sign quantity and copy:

1. Sign Type 1: 2 - "FAMILY" with male, female, and child pictograms, international symbol of accessibility and braille.
2. Sign Type 2: 0 - "MALE" with male pictogram and braille.
3. Sign Type 3: 0 - "WOMEN" with female pictogram and braille.
4. Sign Type 4: 0 - "COMPANION" with male and female pictograms, international symbol of accessibility and braille.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions for vandal-resistant permanent exterior mounting without exposed fasteners.

B. Install neatly, with horizontal edges level.

C. Locate signs where indicated:

1. If no location is indicated, obtain Agency Project Manager's instructions.

D. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 1463
COLOR LED SIGN

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be "design/build" by contractor utilizing specific equipment and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment, and services to construct and install the complete Color LED Sign system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit a complete system plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 SECTION INCLUDES

A. LED Display Board

B. LED message centers.

C. Control software.

1.4 REFERENCES

A. Standard for Electric Signs, UL48, CUL48, UL Energy Efficiency Verified (Green Leaf certification).

B. Standard for Control Centers for Changing Message Type Signs.

C. Federal Communications Commission Part 15 Regulations for A Class devices

D. National Electric Code.

E. Designed to current IBC standards.

1.5 SUBMITTAL

A. The electronic LED display manufacturer shall provide a complete technical submittal within 60 days of contract award and shall not proceed with LED Matrix manufacture until the submittal is approved.

B. Submit:

1. All LED display manufacturer qualifications, as specified herein.
2. LED display installation drawing.

3. AC Site Power Requirements, including legs and Amps per leg.
4. LED display control software operator's manual.
5. LED display installation and maintenance manual.

1.6 QUALIFICATIONS

A. Approved Manufacturers: Color LED Sign manufacturer shall include but is not limited to:

1. Watchfire Signs, LLC.
2. Approved alternate.

B. LED display manufacturer shall:

1. Have an onsite quality assurance lab to verify product integrity.
2. Have at least one (1) Project Manager with PMI certification. Have a minimum of 75 years electrical sign manufacturing experience and 20 years of LED display manufacturing experience prior to the contract bid date.
3. Have a minimum of 50,000 permanently mounted LED displays in operation for a minimum period of one (1) year prior to the contract bid date.
4. Provide support via domestic, toll-free help desk and an online service knowledge base.
5. Provide proof of liability coverage of $10,000,000 aggregate.

C. Manufacturing experience with the following types of electronic signs shall not satisfy the requirements:

1. Matrix displays that show a limited quantity of messages.
2. LCD displays.
3. Back-lit displays.

1.7 WARRANTY

A. Warranty against material defects in material and workmanship for five (5) years from the date of shipment from factory dock.

B. Provide a ten (10) year parts availability guarantee.

C. Replacement parts shipped the same day when requested by 3 p.m. CT.

D. Provide toll-free service coordination.

PART 2 - PRODUCTS

2.1 LED Display

A. Cabinet Construction:

1. Cabinet dimensions shall be as indicated in Drawings. The front-to-back cabinet depth shall not exceed 8 inches.
2. The cabinet shall contain a full LED matrix measuring a minimum of (30) pixel rows high by (30) pixel columns wide. True-10mm 900 Pixel/module.
3. Display configuration is single-face, one sided display.
4. The distance from the center of one line or column of pixels to the center of all adjacent lines or columns shall be Line Spacing 10.16mm both horizontally and vertically.
5. Maximum display power per face shall not exceed (20) Amps when 100% of the pixels are operating at their maximum possible drive current.
6. Cabinet weight per face shall not exceed 9lbs/sq ft
7. Display shall operate from the following power sources: 120/240 VAC, 60 Hz single-phase, including neutral and earth ground.
8. Display shall operate in a minimum ambient temperature range of -40° to +140°F (-40 to +60°C) and to 95% humidity.
9. Internal display component hardware (nuts, bolts, screws, standoffs, rivets, fasteners, etc.) shall be fabricated from stainless steel, aluminum, nylon, or other durable corrosion-resistant materials suitable for the signage application.
10. Module components shall be 100% solid-state.
11. Display performance may not cause harmful radio, magnetic or electromagnetic interference. The display must accept any interference received, including interferences that may cause undesired operation.

B. Housing Frame:

1. Display materials shall use non-corrosive materials or have a protective coating so they shall be anti-corrosive and not degrade or oxidize.
2. Cabinets must be constructed from extruded aluminum with precision-mitered corners, solid welds, and stainless fasteners.
3. The display shall be front or rear ventilated with adequate ventilation provided using fans.
4. Steel mounting points that can be used for mounting purposes shall be provided with the display and have the ability to be adjusted for alternative mounting methods.
5. Shall include lifting supports that can be removed after installation.

C. Exterior Finish:

1. The LED display front-facing cabinet shall be coated with a baked acrylic enamel.

D. Front Face Construction:

1. To meet the display readability requirements, the front face must be constructed in such a manner that it provides high contrast, low sunlight reflection and durability in all weather and site conditions.
2. Minimum features of front face shall:

    a. Provide UV resistance to prevent discoloring.

b. Include horizontal louvers over LEDs for contrast enhancement and sunlight shading.
c. Include vertical light traps to reduce light spill.
d. Use surface materials in the active LED area, such as metal, plastic, or other face materials, designed for low sunlight reflectivity.

E. Serviceability:

1. The display housing shall provide safe and convenient rear and/or front service access for all modular assemblies, components, wiring, and other materials located within the housing.
2. All internal components shall be removable and replaceable by a single technician with proper tooling.
3. Service access shall be easily obtained by removal of one or more modules in front of the associated internal component and/or rear access panel.
4. Each module should allow easy removal with a latch with positive stops.
5. Displays shall be designed with service features that minimize potential bodily harm.

2.2 DISPLAY COMPONENTS

A. LED display modules shall be constructed for good readability, long life, and ease of service. Each display module shall be constructed as follows:

1. Each module within the product family shall be designed with the same physical footprint of 12” x 12”.
2. All modules and their components shall be fully encapsulated and sealed to meet IP-67 standards.
3. An LED module shall consist of LEDs with all drive electronics mounted on a single Printed Circuit Board (PCB).
4. LEDs shall be auto-inserted in order to maintain quality and uniformity of the LEDs within each LED module.
5. All surface mount LEDs shall be soldered using a reflow process to ensure uniformity, quality, and durability of all solder joints.
6. All PCBs shall be cleaned in a manner so as not to contain more than 2 parts per million contaminants.
7. Module signal and electrical connections shall be of the positive locking and removable type. Removal of a module from the display shall not require a de-soldering operation.
8. All LED display modules in a single display shall be identical in construction and interchangeable throughout the display with the ability to be field calibrated.
9. Display must be whole-sign color calibration, color and brightness before leaving factory.
10. Modules shall be individually attached to the cabinet frame.
11. Removal of one or more modules shall not affect the display’s structural integrity.
12. The distance from the center of one line or column of pixels to the center of all adjacent lines or columns shall be 10.16mm both horizontally and

vertically.

13. Data shall be redundant, ensuring signal is communicated to the module from alternate directions in the event of a loss in signal path.
14. Confines high speed data signals to individual smart LED modules, each with its own microcontroller that runs the LEDs.
15. The display must not send high speed data signals from a receiver card to the module over multi-conductor cables to display an image.
16. The failure of a single pixel, module or power supply shall not cause the failure of any other pixel, module or power supply in the display.
17. All modules shall have no less than a 150° horizontal half-intensity viewing angle.
18. The transition of the viewing intensity shall be consistent throughout the viewing cone.
19. Pixels shall be constructed with 3 in 1 SMD LEDs, and these 3 in 1 SMD LEDs shall conform to the following specifications:
20. LEDs shall be diffused, ultra-bright, solid-state light emitting diodes.
21. Each color of LEDs used in all LED displays provided for this contract shall be from the same bin.
22. LED half-life shall be an estimated minimum of 100,000 hours.
23. Display shall have a minimum intensity of 7,000 nits maximum light output.

B. Power Supply:

1. All power supplies shall be regulated, auto-ranging AC to DC power, with protection for the LED pixel, LED display and driver circuitry in the event of power spikes or surges.
2. Each power supply and their connectors shall be fully sealed to protect from corrosive environmental factors meeting IP-67 standards.

C. Internal Wiring:

1. Use smart module design to minimize cables needed, reduce potential points of failure and reduce Mean Time Between Failures (MTBF).
2. Cables must be engineered and tested to withstand environmental conditions by using high grade automotive connectors instead of insulation displacement (ribbon-type cables) connectors.
3. Wiring for LED display modules and other internal components shall be installed in the housing in a neat and professional manner.
4. Wiring shall not impede the removal of display modules, power supplies or other display components.
5. Wires shall not make contact with or be bent around sharp metal edges.
6. All wiring shall conform to the National Electric Code.

D. The display shall be protected from electrical spikes and transients.

E. The manufacturer shall provide an earth-ground lug on the display.

2.3 DISPLAY PERFORMANCE

A. Display Capability:

1. The LED display shall present messages that are continuous, uniform, and unbroken in appearance.
2. The LED display shall be capable of producing 1.2 quintillion colors.
3. Each display pixel shall be composed of one each – red, green, and blue LEDS configured in a SMD pixel package.
4. The display shall be able to display messages composed of any combination of alphanumeric text, punctuation symbols, and graphic images.
5. Video and message files shall have up to a 60 frame per second playback capability.

B. Controller:

1. The display's controller shall be able to run independently from a content management system, allowing the display to continue to operate even if the controlling system is unreachable.
2. Each controller shall be connected to a light sensor allowing each LED display to automatically adjust brightness according to display direction and lighting conditions.
3. The controller shall allow connection to a temperature sensor that provides accurate site temperatures.
4. Active presentations, stored presentations, schedules, display configuration, time and date shall be stored in non-volatile memory. No external power or battery backup will be required to maintain this data.

C. Control and Communications:

1. The display controller should be DHCP-enabled or allow for static IP addressing.
2. Each single-faced display shall be controlled and monitored by its own display controller. Or a double-faced display shall be controlled and monitored by a single display controller.
3. The display controller shall receive content and schedule instructions using one of the following communication modes:

    a. Internet via Ethernet cellular modem.
    b. Fiber-optic cable routed to adjacent restroom building (Fiber must be dual strand fiber with OM1 SD Multimode connectors.).
    c. Point-to-point RWF radio
    d. Point-to-point high security radio

2.4 CONTROL SOFTWARE

A. Control Software Option 1: Create, schedule, and deliver content via Ignite OPx cloud-based software. Software to be hosted on manufacturer's servers at no cost to the customer.

1. Includes browser-based online editor for creating content, multiple content zones, playlists.
2. Able to integrate widgets and RSS feeds.

3. Include a content library of more than 1000 pieces of graphics and animations.
4. Allows for smart scheduling, which eliminates competing products to display in the same daypart.
5. Import and store JPG, GIF, PNG, and TGA image files; MP4 video files with HD 1080 capability; MP3, WAV and WMA audio files.

B. Control Software Option 2: Approved third-party software similar to that described above.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Mounting structure to be installed by contractor to support desired displays in all locations. Verify that separate conduit is in place for power and data to display, unless fiber is being used. Verify that all control equipment has access to 120/240 VAC.

3.2 INSTALLATION

A. Support structure design depends on the mounting methods, display size, and weight. The structure design is critical and should be done only by a qualified individual. It is the contractor's responsibility to ensure that the structure and mounting hardware are adequate.

B. It is the contractor's responsibility to ensure that the installation meet local standards. The mounting hardware shall be capable of supporting all components to be mounted.

C. All mounted displays must be inspected by a qualified structural engineer.

D. Possible power and signal entrances are designated by etched markings. Separate conduit must be used to route the power, signal in wires, and signal out wires.

E. Displays must be grounded according to the provisions outlined in Article 250 of the National Electrical Code. The display must be connected to earth-ground. Proper grounding is necessary for reliable equipment operation and protects the equipment from damaging electrical disturbances and lightning.

F. All installations shall conform to Article 600 of the National Electrical Code.

END OF SECTION

SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Accessories for toilet rooms.

1.2 RELATED REQUIREMENTS

A. Electrical Drawings: Air hand dryer.

1.3 REFERENCE STANDARDS

A. None.

1.4 SUBMITTALS

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

B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Toilet Accessories:

1. American Specialties, Inc: www.americanspecialties.com.
2. Bradley Corporation: www.bradleycorp.com.
3. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
4. Substitutions: Section 01 6000 - Product Requirements.

2.2 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.

B. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.

C. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FINISHES

A. Stainless Steel: No. 4 satin brushed finish.

2.4 TOILET ROOM ACCESSORIES

A. Soap Dispenser: Liquid soap dispenser, integral with lavatory, reservoir in pipe chase.

1. Tank: American Specialties 0378 2 1/2 gallon (9.5 L) surface mounted reservoir located in Valve/Storage Room.
2. Soap Valve: American Specialties 0353 standard liquid soap valve.

B. Grab Bars:

1. Bobrick B-6806 Series as indicated in Drawings.

C. Toilet Paper Dispensers:

1. Surface-mounted, keyed dispenser for double nine-inch diameter roll – 2 dispensers per room, Bobrick B-2892.

D. Mirrors:

1. 24” x 36” with stainless steel frame and replaceable acrylic glass cover pane. Use concealed wall hanger with theft-resistant locking device.

E. Hand Driers:

1. ADA compliant World Dryer VERDEdri Q-974A, 110V White
2. Approved alternate.

F. Sanitary Napkin Disposal Receptacles:

1. Stainless Steel, surface mounted, inner liner: Bobrick B-254.
2. 1 per room.

G. ADA Compliant Bench [Accessible Bench]:

1. Salsbury ADA Locker Bench as manufactured by Salsbury Industries.

   a. 48 Inches Wide - Aluminum.
   b. Model # 77772-ADA or approved alternate.

H. Baby Changing Station:

1. Bradley's 962-11 Baby Changing Station or approved alternate.
2. Surface mounted.
3. ADA compliant.
4. Bacterial-Resistant High-Density Plastic with Stainless Steel exterior.

5. Pneumatic gas shock mechanism.

PART 3 - EXECUTION

3.1 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

3.2 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Provide all piping and connections for fully operational soap dispenser system. Install tank at elevation required for gravity flow to soap valve.

D. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

E. Connect to lavatory soap valves.

END OF SECTION

SECTION 22 0000
GENERAL PLUMBING PROVISIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be "design/build" by contractor utilizing specific fixtures and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment and services to construct and install the complete plumbing system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit a plumbing plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 RELATED WORK:

A. The General Provisions apply to this Division, including but not limited to:

1. Drawings and Specifications.
2. Contract Modifications, addendums and change orders.

B. Division 1, General Requirements, applies to this Division.

C. Related work provided in Divisions 02 through 10.

D. Related Work provided in Division 23 and 26.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:

1. All work, installations, materials and equipment shall comply with the provision of the following codes, referenced standards, and regulations, except where more stringent requirements are shown or specified:

a. Oregon Plumbing Specialty Code.
b. Oregon Mechanical Specialty Code.
c. Oregon Structural Specialty Code.
d. Oregon Electrical Specialty Code.
e. Oregon Fire Code
f. All City, County, State and Federal applicable laws and regulations.
g. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.

2. Should there be any direct conflict between Codes and the Drawings and Specifications, the Codes' rules and regulations shall govern.
3. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.
4. Should the Documents indicate a condition, which will conflict with the Codes, the Contractor shall inform the Agency's Representative and refrain from installing that portion until resolved. Any work installed in violation of the Codes will be removed and correctly installed as part of the Contract work.
5. If the Drawings and Specifications indicate a higher quality than code, the Drawings and Specifications shall govern.
6. Electrical products shall bear the U.L. label.

B. The entire plumbing system shall operate correctly at full capacity without objectionable noise, vibration or decrease of efficiency.

C. Materials and Equipment:

1. Equipment furnished shall meet all requirements of the Drawings and Specifications and be suitable for the installation. Equipment not meeting all requirements will not be acceptable.
2. Where two or more units of the same class of equipment are furnished, use products of the same manufacturer.
3. Furnish all materials and equipment, new and of size, type, and quality herein specified.

D. Workmanship:

1. Follow manufacturers' instructions. If they are in conflict with the Drawings and Specifications, obtain clarification from the Engineer prior to beginning the work.

E. Cutting and Patching:

1. Provide for cutting, patching and repairing for the installation of the work specified, including masonry work, concrete work, carpentry work and painting. Work shall be performed by skilled craftsmen of the respective trade.

1.5 PROJECT CONDITIONS:

A. The locations of all utilities, wires, conduits, pipes, duct, or other service facilities are shown in a general way only on the Drawings and are taken from existing public records. Ascertain whether any additional facilities other than those shown on the plans may be present and determine the exact location and elevations of all utilities prior to commencing installation.

B. Prior to bid, contact the local utility companies to verify requirements. Provide all material and labor by utilities.

C. The Contractor, before submitting a Bid on the work, must visit the site to become familiar with all visible existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such visible existing conditions. The submission of the bid will be considered an acknowledgement of the part of the Bidder of visitation to the site.

D. The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

E. Coordinate exact requirements governed by actual job conditions. Check all information and report all discrepancies before fabrication work. Report changes in the time to avoid unnecessary work. Make changes as directed by Agency's Representative.

1.6 SUBSTITUTION AND PRODUCT OPTIONS:

A. See Division 01.

B. The use of manufacturer's names, models and numbers in the Drawings and Specifications is intended to establish style, quality, appearance and usefulness. The model numbers listed are the last available to the designer, if no longer current, substitute equipment equal to or better than that represented by the model number listed. Items noted "or equivalent" will require prior acceptance.

C. Submit for the Agency's Representative's review, manufacturer's detailed specifications and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, or specific data need for consideration of approval. All pertinent data listed in the Specifications and on the Drawings shall be furnished, including all special features. See that all submittals are in proper order, and that all equipment will fit the space provided.

D. All requests for approval of substitutions for materials other than those specified must be submitted in accordance with Instructions to Bidder.

E. All changes required due to product substitutions are the responsibility of the Contractor.

1.7 PROJECT RECORD DRAWINGS:

A. Obtain drawings from Engineer.

B. Keep Drawings clean, undamaged and up to date.

C. Record and accurately indicate the following:

1. Depths, sizes and locations of all buried and concealed piping.
2. Locations of all clean-outs.
3. Changes, additions and revisions due to contract modifications.
4. Locations of tracer wire terminal points.

D. Drawings to be available for Engineer review.

E. Submit as a part of Project Closeout Documents

1.8 CONTRACT MODIFICATIONS:

A. In addition to the requirements of the General provisions, all supplemental cost proposals for this Division of work shall be accompanied by a complete itemized breakdown of labor and materials for each item. No exceptions will be made. Contract's estimating sheets for supplemental cost proposals shall be made available upon request. Labor must be separated and allocated to each item of work. Changes or additions subject to additional compensation made without written authorization based on agreed price shall be at Contractor's own risk and expense.

1.9 STORAGE AND HANDLING

A. Delivery: Deliver to project site with manufacturer's labels intact and legible.

B. Handling: Avoid damage.

C. Storage: Store material inside, protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.10 WARRANTY:

A. Provide a written guaranty covering the work of this Division for a period of one calendar year form the data of acceptance of the entire project as required by the General Provisions.

B. Provide manufacturer's written warranties for material and equipment furnished under this Division insuring parts and labor for a period of one year from the date of acceptance of the entire project.

C. Correct warranty items promptly upon notification.

1.11 OPERATIONS AND MAINTENANCE DATA:

A. Prior to final inspection, provide three (3) copies of manufacturer's maintenance manuals for each piece of equipment or items requiring service. Manual shall include manufacturer's operation and maintenance instruction manuals and parts list for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data and any additional equipment added by contract modification. Comply with provisions of Section 01 7800 where applicable.

B. Submit bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.

C. Prepare binder covers with printed title “OPERATION AND MAINTENANCE INSTRUCTIONS”, title of project, and subject matter of binder when multiple binders are required.

D. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titling clearly printed under reinforced lamented plastic table.

1.12 SUBMITTALS:

A. Design Drawings: Indicate the general layout of the piping and various items of equipment and fixtures, suitable for submission for a plan review by the authority having jurisdiction.

B. Product Data:

1. Submit for review manufacturer’s detailed shop drawings, specifications and stat sheets for all equipment to be furnished, as well as any wiring diagram showing field installed wiring and devices. Arrangement of plumbing fixtures has been based on items of specific manufacturer intended as diagrammatic only.
2. Indicate construction, capacities, accessories, etc. Manufacturer’s abbreviations or codes are not acceptable.
3. List the name of the motor manufacturer for each piece of equipment.

C. Submission Requirements:

1. Shop Drawings and Product Data:

   a. Refer to Division 01

2. Sample: Submit samples required by each Section of Division 22 at the same time that shop drawings and product data are submitted.

D. It shall be the Contractor’s responsibility to:

1. See that all submittals are in proper order.
2. Ensure that all equipment will fit in the space provided.
3. Assure that all deviation from Drawings and Specification are specifically noted and called to the attention of the Engineer/Contracting Officer in the submittals. Failure to comply will void approval automatically.
4. Deviation, discrepancies, and conflicts between the submittals and the contract documents discovered prior to or after the review process shall not relieve the Contractor of this responsibility to comply with the contract documents.

1.13 START-UP:

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Agency’s Representative seven days prior to start-up of each item.

C. Verify that each piece of equipment of system has been checked prior to start-up for proper lubrication, drive rotation, belt tension, control sequence, or other conditions, which may cause damage.

D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are completed and tested.

F. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

1.14 FEES, PERMITS AND INSPECTIONS: The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

1.15 DEFINITIONS

A. "Furnish: Means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.

B. "Install": Describes operations at project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

C. "Provide": Means to furnish and Install, complete and ready for intended use.

PART 2 - PRODUCTS

2.1 MATERIAL:

A. All materials and products used for construction shall be new, of the best grade, and the latest products as listed in printed catalog data. All articles of a kind shall be the standard product of a single manufacturer. Trade names and manufacturers' names denote a character and quality of equipment desired and shall not be construed as limiting competition.

B. Asbestos: Do not use products made of or containing asbestos.

2.2 QUALITY ASSURANCE

A. Refer to Division 01 Material and Equipment for information regarding available alternatives to materials and equipment specified herein. Product listings are for informational purposes only and establish a general standard of quality.

B. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner

characteristics and similar adaptations for the project.

PART 3 - EXECUTION

3.1 INSPECTION:

A. All work and materials are subject to field observation at any and all times by the Agency's Representative.

B. The Contractor shall notify the Agency's Representative a minimum of two days prior to testing any piping system which must be witnessed and accepted before it is covered up or enclosed.

C. Cover or otherwise suitably protect equipment and materials stored on the job site.

3.2 CLEANING

A. General: Clean plumbing equipment, fixtures, piping of stampings and markings (except those required by codes), iron cuttings, and other refuse.

B. Painted Surfaces: Clean scratched or marred painted surfaces of rust or other foreign mater and paint with matching color industrial enamel, except as otherwise noted.

C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.

D. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.

3.3 LAYOUT AND COORDINATION

A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, roughing-in dimensions and equipment locations before proceeding with any of the work.

B. The existence of any wires, conduits, pipes, ducts or other service facilities is not necessarily shown. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.

C. The location of all utilities indicated on the plans is taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown may be present.

D. Sleeves, Insets, Cast-in-Place Work: provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.

E. Coordination:

1. Where the work must be sequenced and positioned with precision in order to fit into the available space, prepare accurate scale shop drawings showing the actual physical dimensions required for the installation and submit prior to purchase-fabrication-installation of any of the elements involved in the coordination.
2. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.
3. Coordinate all work with other trades and determine in advance where interfacing of the mechanical work and other work are required to be connected together. Provide all materials and equipment to make those connections. Submit shop drawings showing required connections where special conditions exist.

F. Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions. Do not proceed with any questionable items of work until clarification of same has been made. Should rearrangement or re-routing of ducts or piping be necessary, provide for approval the simplest layout possible for that particular portion of the work.

3.4 TEMPORARY FACILITIES AND CONTROLS

A. Comply with Division 01 requirements.

B. Permanent plumbing systems' equipment utilized for temporary facilities shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.

C. Agency's warranties shall not be abridged by Contractor's use of the permanent systems' equipment prior to final acceptance. Warranty period shall begin at final completion.

3.5 CLOSEOUT

A. General: Refer to the Division 01 sections for general closeout requirements. Calibrate all equipment requiring same.

B. Record Drawings: Submit record set of drawings required in Division 01, Submittals and as previously specified in this Section.

C. Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment and each system in a test run of appropriate duration with the Engineer present, and with the Agency's operating personnel present, to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty strainers, excessively worn parts and similar expendable items of the work.

D. Operation and Instruction: Provide up to eight (8) hours of on-site training to Agency's personnel on all mechanical systems and equipment. Training shall include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system. Three (3) copies of written manuals shall be left with Agency at end of training.

END OF SECTION

SECTION 22 0300
PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The requirement of this section applies to the plumbing system.

1.2 QUALITY ASSURANCE

A. Codes: Section 22 0000.

B. Fixtures: By same manufacturer for each product specified throughout. Color shall be stainless steel unless indicated otherwise.

C. Trim: By same manufacturer for each product specified throughout.

1.3 SUBMITTALS

A. Submit product data under provisions of Section 22 0000.

B. Include fixtures, sizes, utility sizes, trim, and finishes.

C. Submit for:

1. All fixtures.
2. Drains.
3. Water Heaters.
4. Grease interceptors.
5. Pumps.
6. Hose bibs.
7. Hose reels.
8. Oil Water Separators.

1.4 PLUMBING FIXTURES

A. General: Provide factory fabricated fixtures of type, style and material indicated on the plumbing fixture connection schedule. For each type fixture, provide manufacturer's standard trim, carrier, seats and valves as scheduled or as recommended by manufacturer as required for complete installation.

1. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps, stops and additional devices required.
2. Exposed IPS Piping and Tubing: Brass, chrome plated.
3. Escutcheons: Brass, chrome plated.
4. Fixtures Locations: As shown on Architectural Drawings.
5. Stops: Stops installed on each supply pipe at each fixture accessibly

located with wall escutcheons.

6. Showers, Public lavatories, Interior Faucets: Provide with flow control device per code.

1.5 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 22 0000.

PART 2 - PRODUCTS

2.1 INTERIOR PLUMBING MATERIALS

A. Cleanouts:

1. Manufacturer: J.R. Smith, Jonespec, Zurn, Wade, or accepted substitute.
2. Types:

   a. Tile Floor Cleanouts: Smith 4053-U with square heavy-duty nickel bronze top, taper thread, bronze plug, and vandalproof screws.
   b. Carpeted Floor Cleanout: Smith 4023-U-X with round heavy-duty nickel bronze top, taper thread, bronze plug, carpet clamping device and vandalproof screws.
   c. Concrete Floor Cleanout: Smith 4023-U with round heavy-duty nickel bronze top, stainless steel shallow cover and vandalproof screws.
   d. Wall Cleanouts: Smith 4472-U, bronze ferrule with raised head bronze plug, stainless steel shallow cover and vandalproof screws.
   e. Outside Area Walks and Drives: Smith 4253-U-G with galvanized cast iron body, top secured with vandalproof screws, taper thread and bronze plug. Install in 18" x 18" x 6" deep concrete pad flush with grade.

B. Flashing: Minimum 4# sheet lead; to extend horizontally 10" from edge of vent penetrations or rain drain body and vertically 12" minimum up from roof turned over and down into hub of vent or finished with bronze cap providing counterflashing for screwed pipe.

C. Shock Arrester: Precharged bellows or sealed piston type manufactured to meet PDI WH-201 and ASSE 1010 Standards. Size in accordance with PDI procedures. Jonespec, J.R. Smith, PPP, Wade, Zurn, or accepted substitute.

D. Traps: Provide traps on all fixtures except fixtures with integral traps. Exposed traps chromium plated cast brass or 17 gauge chrome plated brass tubing. American Standard, Kohler, Chicago, Brasskraft, Eastman, Speedway, McGuire or approved substitute.

E. Supplies and Stops: First quality, chrome plated with brass stems. Stops: loose key type. American Standard, Kohler, Chicago, Brasskraft, Eastman, Speedway, McGuire or approved substitute.

F. Thermometers: 3-inch diameter bi-metal dial thermometer with stainless steel case, white dial, black numbers with 4-inch stainless steel stem and brass separable socket. Provide back or bottom connections as required. 0°F to 200°F range. Weiss, Palmer, Ashcroft, Trerice, Marshalltown, Weksler or approved substitute.

G. Pressure Gauges: Single arm guide gauge with 0 to 160 range, 20 PSI intervals and 2 PSI incremental graduations. Aluminum dial with 1 percent accuracy and low bottom connections for wall mounting. Weiss, Palmer, Ashcroft, Trerice, Marshaltown, Weksler or approved substitute.

2.2 ELECTRIC TANKLESS COMMERCIAL WATER HEATERS:

A. Electric tankless commercial water heater(s), UL 499, sized for low flow constant temperature requirements, low flow activation, and overheat protection.

1. Heat Exchanger: Copper tubing with brazed brass fittings and large internal passageways for minimal pressure drop. NSF 61 barrier materials for potable water, without storage capacity.
2. Rating: 150 psig.
3. Heating Element: Heavy duty, low-watt density Incoloy 800 sheathed resistive element.
4. Mounting: Wall mounted.
5. Capacity:

    a. Temperature Rise at Flow Rate: 60 deg F at 10 gpm plus flow from hot hose.
    b. Adjustable Temperature Setpoint: 110 deg F.

6. Low Flow Activation: 0.25 GPM
7. High Flow Capacity: Combined high flow rate of one or more heaters capable of meeting hot water demands of the greater of all restroom lavatories operating simultaneously or all but one restroom lavatory operating simultaneously with the full flow from one 5/8 inch diameter hose.

B. Manufacturer: Hubbell, Keltech, or approved alternate.

C. Provide a recirculating piping and pump system between water heater(s) and lavatories and arrange system so that one or more heaters will activate only as required to meet heated water flow demands.

2.3 PRIMING VALVES:

A. Smith 2699, Wade, Zurn, PPP or accepted substitute. Locate in closets, under counters or in walls behind Milcor or access panels. Use copper for all underground priming lines.

2.4 PLUMBING FIXTURES

A. Stops: Furnish stop valves for all fixtures. In-line non-adjustable, located in pipe chase (pattern to fit installation). Kohler, Speedway, Chicago, Eastman, Brasskraft, or accepted substitute.

B. Water Closet

1. Install each wall hung water closet with code approved electric flush meter, quiet acting, chrome plated, screwdriver stop and vacuum breaker as recommended by water closet manufacturer.
2. Basis of design, Manufacturers Model: Willoughby ETW-1490-CM Stainless steel, carrier mounted (3-bolt), wall outlet, blowout series toilet.

C. Lavatories

1. Provide wall backing plate for lavatory assembly and assemble lavatory with faucet as required.
2. Basis of design, Manufacturers Model: Willoughby ES-1015-HC Handicap Stainless Steel Commercial Lavatory.

D. Floor Drains

1. FD-1 Cast iron body, double drainage flange with weep holes, priming connection, nickel bronze strainer finish, flashing clamp device, adjustable or insert type strainer. Comply with ANSI. Smith Model 2005-A, Josam, Zurn, or accepted substitute.

E. Floor Drains integral cleanout.

1. FD-2 Cast iron body, double drainage flange with weep holes, priming connection, nickel bronze strainer finish, flashing clamp device, adjustable or insert type strainer. Comply with ANSI.
2. Basis of design, Manufacture Model, Smith Model 2040.

F. Floor Sink

1. Basis of design, Manufacturer Model, Gamut #968Z178

G. Auto-flush valve

1. Quiet, diaphragm type, chrome plated closet flushometer, infrared sensor with indicator light, chrome plated wall cover plates with vandal resistant screws.
2. Basis of design, Manufacturer Model: Royal 152-1.6 ES-S.

2.5 HOSE BIBBS

A. Freezeless (frost-free).

B. For cold water as indicated.

C. Basis of design: Hose Box with integrated hose bib shall be Willoughby Model No. HB-8151 or approved alternate locking hose box with hose bib.

2.6 SURGE TANK

A. As required. Coordinate with Agency.

2.7 PIPE SLEEVES

A. Interior Wall Sleeves: 12 gage galvanized steel, flush with wall on both sides.

B. Interior Floor Sleeves: 12 gage galvanized steel and extend 2-inches above finished floor.

C. Exterior Wall Sleeves: Cast iron, flush with wall on both sides.

D. On Grade Floor Sleeves: Same as exterior wall sleeves.

2.8 ESCUTCHEONS

A. Brass material, chrome plated finish. Size sufficient to cover all pipe openings through wall, floor or ceiling. Set screw or spring to secure to pipe.

2.9 UNIONS

A. Steel pipe union shall be 150-pound malleable iron, brass to iron seat, ground joint, black or galvanized to match pipe.

B. Copper pipe union shall be 200 psig working pressure. Bronze body. Solder ends.

C. Insulating unions shall be 250 psig working pressure. Pipe ends and material to match piping.

D. Electric current below 1% of galvanic current. Gasket material as recommended by manufacturer. Epco or approved.

PART 3 - EXECUTION

3.1 INSPECTION

A. Confirm location and size of fixtures and openings before rough- in and installation.

B. Verify adjacent construction is ready to receive rough-in work of this Section.

C. Review rough-in locations of potable water and waste piping systems to verify actual locations prior to installing fixtures.

3.2 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.

B. Install components level and plumb.

C. Install and secure fixtures in place with wall carriers and bolts. Install fixtures as shown on drawings.

1. Support all wall hung water closets and urinals on heavy duty, concealed, chair carriers mounted to floor structure.
2. Support wall hung lavatories mounted on stud partitions on heavy concealed wall brackets bolted to a steel plate anchored firmly to structure. Floor mounted concealed arm carriers approved.

D. Cleanouts

1. Where required by code, at each change of sewer direction 45 degrees or greater and more than 10' long, at end of each branch or main and spaced not greater than 100' apart, as required by code and/or as shown on Drawings.

E. Install all devices in accordance with manufacturer's written instructions and recommendations.

F. Provide waste piping to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by code.

G. Mechanical Equipment Connections: Connect piping system to mechanical equipment as indicated. Comply with equipment manufacturer's instructions. Provide shutoff valve and union for each connection. Provide drain valve on drain connection.

H. Water Hammer Arrestors: Install in upright position, in locations and of sizes per PDI WH-201.

I. Arrange locations of valves, unions, drains and other components to provide for ease of maintenance, repair or service. Size access panels and locate to provide working spaces for all devices served by access.

J. Provide valves and shock arrestors where required by code and where otherwise indicated in Specifications and on Drawings.

K. Fixtures:

1. Install plumbing fixtures where shown and at appropriate heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings and industry standards.
2. Set and connect to soil, waste, vent and water piping in neat, uniform manner. Connections to be plumb and set at right angles to floor and wall unless otherwise required.
3. Seal fixtures mounted on floors and walls with sealant compounds.

4. Set mixing valves of lavatories to limit temperature to 110°F.

L. Stops: Screwdriver or loose key stops to be installed in hot and cold supply pipe to each fixture accessibly located.

M. Floor Drains:

1. Install drains in accordance with manufacturer's written instructions. See Drawings for locations.
2. Install floor drains at low points of areas to be drained or as indicated. Grate to be flush with finished floor.
3. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
4. Prime all drains. Refer to Drawings. Contractor to prime all drain traps at close of construction. Do not utilize trap primers for fill. Coordinate with local authorities for exact requirements.

N. Hose Bibbs:

1. Install where shown, in accordance with manufacturer's installation instructions.

3.3 ADJUSTING AND CLEANING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow

B. At completion clean plumbing fixtures and equipment.

3.4 INSPECTION

A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Engineer. Remove cracked or dented units and replace with new units.

3.5 ELECTRIC WATER HEATERS

A. Install in accordance with manufacturer's installation instructions.

B. Connect hot and cold water piping to units with shutoff valves and unions. Connect recirculating water line to unit with shutoff valve, check valve and union.

C. Anchor heaters to structure in accordance with manufacturer's installation instructions.

D. See drawings for approximate locations.

END OF SECTION

SECTION 22 0700
MECHANICAL INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide piping and equipment insulation including jacketing, adhesive and all related accessories for complete insulated system.

1.2 QUALITY ASSURANCE

A. Applicator: Company specializing in piping insulation application with three years minimum experience.

B. Insulation, Jacket and all Related Materials: Flame spread rating of 25 and smoke developed rating of 50.

C. Codes: Comply with all applicable codes.

D. Installation: Install in accordance with Manufacturer's recommendations.

1.3 SUBMITTALS

A. Submit product data and installation instructions under provisions of Section 22 0000.

B. Include product description, list of materials and thickness for each service, and locations.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver product to site under provisions of Section 22 0000.

B. Store and protect product under provisions of Section 22 0000.

C. Store insulation in original shipping container with labeling in place. Do not install damaged insulation.

1.5 FIRE HAZARD CLASSIFICATION

A. Maximum fire hazard classification of the composite insulation to be not more than a flame spread of 25, fuel contributed of 50 and smoke developed of 50 as tested by ASTM E84, NFPA 255 and UL 723 method.

B. Test pipe insulation in accordance with the requirements of UL “Pipe and Equipment Coverings R5583 400 8.15.”, ASTM C1136 and ASTM C547.

C. Test duct insulation in accordance with ASTM E84 and ASTM C1071 and bear

the UL label.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Insulating Manufacturers: Johns Manville, Knauf, Armstrong, Owens-Corning, Pabco, IMCOA, Certain Teed or accepted substitute.

B. Adhesive Manufacturers: Benjamin Foster, 3M, Borden, Kingco, or Armstrong.

2.2 PIPING INSULATION, JACKETING AND ACCESSORIES

A. Fiberglass Pipe Insulation:

1. Pipe system to minus 10 to 55 deg. F: Flexible, preformed, pre-slit, self-sealing elastomeric, thermal conductivity of 0.27 Btu/hr. sq. ft./in. at 75 deg. F and vapor transmission rating of 0.2 perms/inch. Apply in thickness necessary to prevent condensation on the surface.
2. Piping Systems 55 to 600 deg. F: Glass fiber preformed pipe insulation with a minimum K- value of 0.23 at 75 deg. F, a minimum density of 3.5 pounds per cubic foot.
3. Pipe System Up to 1200 deg. F: High temperature molded calcium silicate insulation with factory applied aluminum metal jacket. Furnish with aluminum snap straps.

B. Elastomeric Foam: ASTM C534; flexible, cellular elastomeric. Thermal Conductivity value: 0.27 at 75°F. Maximum Flame Spread: 25. Maximum Smoke Developed: 50 (3/4-inch thick and below). Connection: Waterproof vapor retarder adhesve as needed. UV Protection: UV outdoor protective coating as needed.

C. Plastic Pipe Insulation: Flexible unicellular polyolefin foam insulation complying to ASTM C534, ASTM E84 (25/50), UL 723 (25/50). Thermal conductivity of 0.24 (BTU/in)/(hr/sq.ft./deg. F) at 75°F. Preslit longitudinal seam. Imoca.

D. Fiberglass Insulation: Flexible Fiber Glass Blanket: ASTM C612; flexible. Thermal Conductivity Value: 0.24 at 75°F. Maximum Service Temperature: 450°F.

E. Handicapped Lavatory Insulation Kit: ASTM: P-traps, hot water and cold water insulating guards. Molded closed cell vinyl with nylon fasteners, paintable. Thermal conductivity: K=1.17 (BTU/in)/(hr/sq.ft./deg. F) at 75°F mean temperature. Provide accessories as required for complete installation. Color white. Truebro Inc. Model 102. McGuire, ProWrap, Brocar Trap Wrap, or accepted substitute.

F. Jackets:

1. Interior Applications:

   a. Vapor Barrier Jackets: Kraft reinforced foil or vinyl vapor barrier with self-sealing adhesive joints or pressure sensitive seal.
   b. PVC Jackets: One piece, premolded type.

2. Exterior Applications:

   a. Aluminum Jackets: ASTM B209; 0.016 inch thick; smooth finish.
   b. Stainless Steel Jackets: Type 316 stainless steel; 0.010 inch thick; smooth finish.

G. Accessories:

1. Insulation Bands: 3/4 inch wide; 16 gauge stainless steel.
2. Metal Jacket Bands: 0.25 inch thick stainless steel.
3. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.
4. Finishing Cement: ASTM C449.
5. Fibrous Glass Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.

2.3 EQUIPMENT INSULATION

A. Equipment Temperatures Below 70 deg. F: Flexible, closed cell, elastomeric sheet insulation of 5.5 #/cubic feet density and 0.27 thermal conductivity at 75 deg. F.

B. Equipment Temperatures from 70 deg. F to 450 deg. F: Glass fiber 3 pound density insulation with a 0.23 thermal conductivity at 75 deg. F. Foil jacket or finished as recommended by manufacturer.

C. Exterior Tanks and Equipment Insulation Covering: Same as interior insulation with weatherproof metal or finished as recommended by insulation manufacturer.

2.4 PIPE FITTING INSULATION COVERS

A. PVC preformed molded insulation covers. Zeston or accepted substitute.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install materials after piping, ductwork and equipment has been tested and approved.

3.2 PIPING INSULATION INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Continue insulation with vapor barrier through penetrations.

C. In exposed piping, locate insulation and cover seams in least visible locations.

D. Provide an insert, not less than 6 inches long, of same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2 inches diameter or larger, to prevent insulation from sagging at support points. Inserts shall be cork or other heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used.

E. Neatly finish insulation at supports, protrusions, and interruptions.

F. Jackets:

1. Indoor Applications: Insulated pipes conveying fluids above ambient temperature shall have standard jackets, with vapor barrier, factory-applied or field applied. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass cloth and adhesive.
2. Exterior Applications: Provide vapor barrier jackets. Cover with aluminum jacket with seams located on bottom side of horizontal piping. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement.
3. Buried Piping: Do not insulate underground piping unless otherwise noted.

G. Piping Insulation Schedule:

PIPING	PIPE SIZE	INSULATION
Domestic Cold	ALL	½” fiberglass
Domestic Hot/Tempered and	2" and Smaller	1-1/2” fiberglass
Recirculating	2-1/2" and Larger	1-1/2” fiberglass
Piping Exposed to Freezing Horizontal and Vertical	All Sizes	1-1/2” fiberglass

H. Handicapped Lavatory: Insulation as specified.

I. Pipe Fittings:

1. Insulate and finish all fittings including valve bodies, bonnets, unions, flanges and expansion joints with precut fiberglass insulation and preformed PVC covers sealed to adjacent insulation jacket for continuous vapor barrier covering over all fittings.

J. Piping Insulation Lap Seams and Butt Joints: Install insulation jacket in accordance with manufacturer's recommendation. Where jacket joint and lap seams have not adhered, remove affected section of insulation and reinstall.

K. Heat Tracing: Where electric heat tape is to be installed on piping, insulate over the tape.

3.3 PLASTIC PIPE INSULATION

A. Slip insulation on pipe prior to connection. Butt joints sealed with manufacturer's adhesive. Insulate fitting with miter-cut pieces. Cover all insulation exposed to the weather and under grade with 2 coats of finish as recommended by manufacturer.

3.4 FLEXIBLE ELASTOMERIC TUBING

A. Slip insulation over piping or if piping is already installed, it should be slit and snapped over the piping. All joints and butt ends must be adhered with adhesive.

3.5 INSULATION SHIELDS

A. Provide full size diameter hangers and shields (18 gauge minimum) for all cold piping. Hot water piping hangers may penetrate insulation to contact piping directly.

END OF SECTION

SECTION 23 0000
HEATING, VENTILATION, AND AIR CONDITIONING PROVISIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be "design/build" by contractor utilizing specific equipment and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment and services to construct and install the complete mechanical system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit a mechanical plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 RELATED WORK:

A. The General Provisions apply to this Division, including but not limited to:

1. Drawings and Specifications.
2. Contract Modifications, addendums and change orders.

B. Division 1, General Requirements, applies to this Division.

C. Related work provided in Divisions 02 through 10.

D. Related Work provided in Division 22 and 26.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:

1. All work, installations, materials and equipment shall comply with the provision of the following codes, referenced standards, and regulations, except where more stringent requirements are shown or specified:

a. Oregon Plumbing Specialty Code.
b. Oregon Mechanical Specialty Code.
c. Oregon Structural Specialty Code.
d. Oregon Electrical Specialty Code.
e. Oregon Fire Code
f. All City, County, State and Federal applicable laws and regulations.
g. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.

2. Should there be any direct conflict between Codes and the Drawings and Specifications, the Codes' rules and regulations shall govern.
3. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.
4. Should the Documents indicate a condition, which will conflict with the Codes, the Contractor shall inform the Agency's Representative and refrain from installing that portion until resolved. Any work installed in violation of the Codes will be removed and correctly installed as part of the Contract work.
5. If the Drawings and Specifications indicate a higher quality than code, the Drawings and Specifications shall govern.
6. Electrical products shall bear the U.L. label.

B. The entire mechanical system shall operate correctly at full capacity without objectionable noise, vibration or decrease of efficiency.

C. Materials and Equipment:

1. Equipment furnished shall meet all requirements of the Drawings and Specifications and be suitable for the installation. Equipment not meeting all requirements will not be acceptable.
2. Where two or more units of the same class of equipment are furnished, use products of the same manufacturer.
3. Furnish all materials and equipment, new and of size, type and quality herein specified.

D. Workmanship:

1. Follow manufacturers' instructions. If they are in conflict with the Drawings and Specifications, obtain clarification from the Engineer prior to beginning the work.

E. Cutting and Patching:

1. Provide for cutting, patching and repairing for the installation of the work specified, including masonry work, concrete work, carpentry work and painting. Work shall be performed by skilled craftsmen of the respective trade.

1.5 PROJECT CONDITIONS:

A. The locations of all utilities, wires, conduits, pipes, duct, or other service facilities are shown in a general way only on the Drawings and are taken from existing public records. Ascertain whether any additional facilities other than those shown on the plans may be present and determine the exact location and elevations of all utilities prior to commencing installation.

B. Prior to bid, contact the local utility companies to verify requirements. Provide all material and labor by utilities.

C. The Contractor, before submitting a Bid on the work, must visit the site to become familiar with all visible existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such visible existing conditions. The submission of the bid will be considered an acknowledgement of the part of the Bidder of visitation to the site.

D. The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

E. Coordinate exact requirements governed by actual job conditions. Check all information and report all discrepancies before fabrication work. Report changes in the time to avoid unnecessary work. Make changes as directed by Agency's Representative.

1.6 SUBSTITUTION AND PRODUCT OPTIONS:

A. See Division 01.

B. The use of manufacturer's names, models and numbers in the Drawings and Specifications is intended to establish style, quality, appearance and usefulness. The model numbers listed are the last available to the designer, if no longer current, substitute equipment equal to or better than that represented by the model number listed. Items noted "or equivalent" will require prior acceptance.

C. Submit for the Agency's Representative's review, manufacturer's detailed specifications and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, or specific data need for consideration of approval. All pertinent data listed in the Specifications and on the Drawings shall be furnished, including all special features. See that all submittals are in proper order, and that all equipment will fit the space provided.

D. All requests for approval of substitutions for materials other than those specified must be submitted in accordance with Instructions to Bidder.

E. All changes required due to product substitutions are the responsibility of the Contractor.

1.7 PROJECT RECORD DRAWINGS:

A. Obtain drawings from Engineer.

B. Keep Drawings clean, undamaged and up to date.

C. Record and accurately indicate the following:

1. Depths, sizes and locations of all buried and concealed piping.
2. Locations of all equipment.
3. Changes, additions and revisions due to contract modifications.

D. Drawings to be available for Engineer review.

E. Submit as a part of Project Closeout Documents

1.8 CONTRACT MODIFICATIONS:

A. In addition to the requirements of the General provisions, all supplemental cost proposals for this Division of work shall be accompanied by a complete itemized breakdown of labor and materials for each item. No exceptions will be made. Contract's estimating sheets for supplemental cost proposals shall be made available upon request. Labor must be separated and allocated to each item of work. Changes or additions subject to additional compensation made without written authorization based on agreed price shall be at Contractor's own risk and expense.

1.9 STORAGE AND HANDLING

A. Delivery: Deliver to project site with manufacturer's labels intact and legible.

B. Handling: Avoid damage.

C. Storage: Store material inside, protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.10 WARRANTY:

A. Provide a written guaranty covering the work of this Division for a period of one calendar year from the data of acceptance of the entire project as required by the General Provisions.

B. Provide manufacturer's written warranties for material and equipment furnished under this Division insuring parts and labor for a period of one year from the date of acceptance of the entire project.

C. Correct warranty items promptly upon notification.

1.11 OPERATIONS AND MAINTENANCE DATA:

A. Prior to final inspection, provide three (3) copies of manufacturer's maintenance manuals for each piece of equipment or items requiring service. The manual shall include manufacturer's operation and maintenance instruction manuals and parts list for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data and any additional equipment added by contract modification. Comply with the provisions of Section 01 7800 where applicable.

B. Submit bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.

C. Prepare binder covers with printed title “OPERATION AND MAINTENANCE INSTRUCTIONS”, title of project, and subject matter of binder when multiple binders are required.

D. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titling clearly printed under reinforced lamented plastic table.

1.12 SUBMITTALS:

A. Design Drawings: Indicate the general layout of the equipment and ducting, suitable for submission for a plan review by the authority having jurisdiction.

B. Product Data:

1. Submit for review manufacturer’s detailed shop drawings, specifications, and stat sheets for all equipment to be furnished, as well as any wiring diagram showing field installed wiring and devices. Arrangement of mechanical fixtures has been based on items of specific manufacturer intended as diagrammatic only.
2. Indicate construction, capacities, accessories, etc. Manufacturer’s abbreviations or codes are not acceptable.
3. List the name of the motor manufacturer for each piece of equipment.

C. Submission Requirements:

1. Shop Drawings and Product Data:

   a. Refer to Division 01

2. Sample: Submit any samples required at the same time that shop drawings and product data are submitted.

D. It shall be the Contractor’s responsibility to:

1. See that all submittals are in proper order.
2. Ensure that all equipment will fit in the space provided.
3. Assure that all deviation from Drawings and Specification are specifically noted and called to the attention of the Engineer/Contracting Officer in the submittals. Failure to comply will void approval automatically.
4. Deviation, discrepancies, and conflicts between the submittals and the contract documents discovered prior to or after the review process shall not relieve the Contractor of this responsibility to comply with the contract documents.

1.13 START-UP:

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Agency’s Representative seven days prior to start-up of each item.

C. Verify that each piece of equipment of system has been checked prior to start-up for proper lubrication, drive rotation, belt tension, control sequence, or other conditions, which may cause damage.

D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are completed and tested.

F. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

1.14 FEES, PERMITS AND INSPECTIONS: The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

1.15 DEFINITIONS

A. "Furnish: Means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.

B. "Install": Describes operations at project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

C. "Provide": Means to furnish and Install, complete and ready for intended use.

PART 2 - PRODUCTS

2.1 MATERIAL

A. All materials and products used for construction shall be new, of the best grade, and the latest products as listed in printed catalog data. All articles of a kind shall be the standard product of a single manufacturer. Trade names and manufacturers' names denote a character and quality of equipment desired and shall not be construed as limiting competition.

B. Asbestos: Do not use products made of or containing asbestos.

2.2 QUALITY ASSURANCE

A. Refer to Division 01 Material and Equipment for information regarding available alternatives to materials and equipment specified herein. Product listings are for informational purposes only and establish a general standard of quality.

B. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner

characteristics and similar adaptations for the project.

2.3 BASIC FUNCTION [VALVE/STORAGE ROOM ONLY]

A. Provide artificial means of controlling temperature, relative humidity, velocity, and direction of air motion in the interior spaces enclosed by the shell, and reduction of airborne odors, particulates, and contaminant gases.

B. Provide a complete system for VALVE/STORAGE ROOM ONLY composed of a wall-mounted heater and thermostat or similar device with heating capabilities complying with Energy Code Compliance (Drawings sheet G001) limitations and those listed below.

C. Heat source shall be from the building's electric service.

D. Space temperature: Provide a system capable of maintaining a temperature of 40 degrees Fahrenheit.

E. Provide sufficient ventilation to comply with code and to obtain acceptable indoor quality, determined using either the Ventilation Rate Procedure or the Indoor Air Quality Procedure of ANSI/ASHRAE 62.1-2007.

F. Locate outside air intakes away from any air contaminants in accordance with ANSI/ASHRAE Standard 62.1 and applicable codes.

G. Basis of design: Manufacturer Model, Global Industrial Unit Heater, Horizontal Downflow, Multi-Watt, 5000-1881W with digital wall thermostat.

2.4 OPERATION AND MAINTENANCE

A. Maintenance Access

1. All equipment shall be located to maintain ease of access.
2. Equipment utilities shall be routed to allow for access to equipment and replacement without removal of utilities.
3. Equipment shall be located in an area which will allow for complete removal and replacement without demolition to building infrastructure.
4. Provide access doors for access to all enclosed equipment.

PART 3 - EXECUTION

3.1 INSPECTION:

A. All work and materials are subject to field observation at any and all times by the Agency's Representative.

B. The Contractor shall notify the Agency's Representative a minimum of two days prior to testing any piping system which must be witnessed and accepted before it is covered up or enclosed.

C. Cover or otherwise suitably protect equipment and materials stored on the job site.

3.2 CLEANING

A. General: Clean mechanical equipment, fixtures, piping of stampings and markings (except those required by codes), iron cuttings, and other refuse.

B. Painted Surfaces: Clean scratched or marred painted surfaces of rust or other foreign mater and paint with matching color industrial enamel, except as otherwise noted.

C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.

D. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.

3.3 LAYOUT AND COORDINATION

A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, roughing-in dimensions and equipment locations before proceeding with any of the work.

B. The existence of any wires, conduits, pipes, ducts or other service facilities are not necessarily shown. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.

C. The location of all utilities indicated on the plans is taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown may be present.

D. Sleeves, Insets, Cast-in-Place Work: provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.

E. Coordination:

1. Where the work must be sequenced and positioned with precision in order to fit into the available space, prepare accurate scale shop drawings

showing the actual physical dimensions required for the installation and submit prior to purchase-fabrication-installation of any of the elements involved in the coordination.

2. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.
3. Coordinate all work with other trades and determine in advance where interfacing of the mechanical work and other work are required to be connected together. Provide all materials and equipment to make those connections. Submit shop drawings showing required connections where special conditions exist.

F. Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions. Do not proceed with any questionable items of work until clarification of same has been made. Should rearrangement or re-routing of ducts or piping be necessary, provide for approval the simplest layout possible for that particular portion of the work.

3.4 TEMPORARY FACILITIES AND CONTROLS

A. Comply with Division 01 requirements.

B. Permanent mechanical systems' equipment utilized for temporary facilities shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.

C. Agency's warranties shall not be abridged by Contractor's use of the permanent systems' equipment prior to final acceptance. Warranty period shall begin at final completion.

3.5 CLOSEOUT

A. General: Refer to the Division 01 sections for general closeout requirements. Calibrate all equipment requiring same.

B. Record Drawings: Submit record set of drawings required in Division 01, Submittals and as previously specified in this Section.

C. Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment and each system in a test run of appropriate duration with the Engineer present, and with the Agency's operating personnel present, to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty strainers, excessively worn parts and similar expendable items of the work.

D. Operation and Instruction: Provide up to eight (8) hours of on-site training to Agency's personnel on all mechanical systems and equipment. Training shall

include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system. Three (3) copies of written manuals shall be left with Agency at end of training.

END OF SECTION

SECTION 26 0000
ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be "design/build" by contractor utilizing specific equipment and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment and services to construct and install the complete electrical system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit an electrical plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 RELATED WORK:

A. The General Provisions apply to this Division, including but not limited to:

1. Drawings and Specifications.
2. Contract Modifications, addendums and change orders.

B. Division 1, General Requirements, applies to this Division.

C. Related work provided in Divisions 02 through 10.

D. Related Work provided in Division 22 and 23.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:

1. All work, installations, materials and equipment shall comply with the provision of the following codes, referenced standards, and regulations, except where more stringent requirements are shown or specified:

a. Oregon Plumbing Specialty Code.
b. Oregon Mechanical Specialty Code.
c. Oregon Structural Specialty Code.
d. Oregon Electrical Specialty Code.
e. Oregon Fire Code
f. All City, County, State and Federal applicable laws and regulations.
g. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.

2. Should there be any direct conflict between Codes and the Drawings and Specifications, the Codes' rules and regulations shall govern.
3. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.
4. Should the Documents indicate a condition, which will conflict with the Codes, the Contractor shall inform the Agency's Representative and refrain from installing that portion until resolved. Any work installed in violation of the Codes will be removed and correctly installed as part of the Contract work.
5. If the Drawings and Specifications indicate a higher quality than code, the Drawings and Specifications shall govern.
6. Electrical products shall bear the U.L. label.

B. The entire electrical system shall operate correctly at full capacity without objectionable noise, vibration or decrease of efficiency.

C. Materials and Equipment:

1. Equipment furnished shall meet all requirements of the Drawings and Specifications and be suitable for the installation. Equipment not meeting all requirements will not be acceptable.
2. Where two or more units of the same class of equipment are furnished, use products of the same manufacturer.
3. Furnish all materials and equipment, new and of size, type and quality herein specified.

D. Workmanship:

1. Follow manufacturers' instructions. If they are in conflict with the Drawings and
2. Specifications, obtain clarification from the Engineer prior to beginning the work.

E. Cutting and Patching:

1. Provide for cutting, patching and repairing for the installation of the work specified, including masonry work, concrete work, carpentry work and painting. Work shall be performed by skilled craftsmen of the respective trade.

1.5 PROJECT CONDITIONS:

A. The locations of all utilities, wires, conduits, pipes, duct, or other service facilities are shown in a general way only on the Drawings and are taken from existing public records. Ascertain whether any additional facilities other than those shown on the plans may be present and determine the exact location and elevations of all utilities prior to commencing installation.

B. Prior to bid, contact the local utility companies to verify requirements. Provide

all material and labor by utilities.

C. The Contractor, before submitting a Bid on the work, must visit the site to become familiar with all visible existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such visible existing conditions. The submission of the bid will be considered an acknowledgement of the part of the Bidder of visitation to the site.

D. The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

E. Coordinate exact requirements governed by actual job conditions. Check all information and report all discrepancies before fabrication work. Report changes in the time to avoid unnecessary work. Make changes as directed by Agency's Representative.

1.6 SUBSTITUTION AND PRODUCT OPTIONS:

A. See Division 01.

B. The use of manufacturer's names, models and numbers in the Drawings and Specifications is intended to establish style, quality, appearance and usefulness. The model numbers listed are the last available to the designer, if no longer current, substitute equipment equal to or better than that represented by the model number listed. Items noted "or equivalent" will require prior acceptance.

C. Submit for the Agency's Representative's review, manufacturer's detailed specifications and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, or specific data need for consideration of approval. All pertinent data listed in the Specifications and on the Drawings shall be furnished, including all special features. See that all submittals are in proper order, and that all equipment will fit the space provided.

D. All requests for approval of substitutions for materials other than those specified must be submitted in accordance with Instruction to Bidder.

E. All changes required due to product substitutions are the responsibility of the Contractor.

1.7 PROJECT RECORD DRAWINGS:

A. Obtain drawings from Engineer.

B. Keep Drawings clean, undamaged and up to date.

C. Record and accurately indicate the following:

1. Depths, sizes and locations of all buried and concealed wires and conduits.
2. Locations of all equipment.

3. Changes, additions and revisions due to contract modifications.

D. Drawings to be available for Engineer review.

E. Submit as a part of Project Closeout Documents

1.8 CONTRACT MODIFICATIONS:

A. In addition to the requirements of the General provisions, all supplemental cost proposals for this Division of work shall be accompanied by a complete itemized breakdown of labor and materials for each item. No exceptions will be made. Contract's estimating sheets for supplemental cost proposals shall be made available upon request. Labor must be separated and allocated to each item of work. Changes or additions subject to additional compensation made without written authorization based on agreed price shall be at Contractor's own risk and expense.

1.9 STORAGE AND HANDLING

A. Delivery: Deliver to project site with manufacturer's labels intact and legible.

B. Handling: Avoid damage.

C. Storage: Store material inside, protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.10 WARRANTY:

A. Provide a written guaranty covering the work of this Division for a period of one calendar year form the data of acceptance of the entire project as required by the General Provisions.

B. Provide manufacturer's written warranties for material and equipment furnished under this Division insuring parts and labor for a period of one year from the date of acceptance of the entire project.

C. Correct warranty items promptly upon notification.

1.11 OPERATIONS AND MAINTENANCE DATA:

A. Prior to final inspection, provide three (3) copies of manufacturer's maintenance manuals for each piece of equipment or items requiring service. Manual shall include manufacturer's operation and maintenance instruction manuals and parts list for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data and any additional equipment added by contract modification. Comply with provisions of Section 01 7800 where applicable.

B. Submit bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.

C. Prepare binder covers with printed title “OPERATION AND MAINTENANCE INSTRUCTIONS”, title of project, and subject matter of binder when multiple binders are required.

D. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titling clearly printed under reinforced lamented plastic table.

1.12 SUBMITTALS:

A. Design Drawings: Indicate the general layout of the equipment and wiring, suitable for submission for a plan review by the authority having jurisdiction.

B. Product Data:

1. Submit for review manufacturer’s detailed shop drawings, specifications and stat sheets for all equipment to be furnished, as well as any wiring diagram showing field installed wiring and devices. Arrangement of electrical fixtures has been based on items of specific manufacturer intended as diagrammatic only.
2. Indicate construction, capacities, accessories, etc. Manufacturer’s abbreviations or codes are not acceptable.
3. List the name of the motor manufacturer for each piece of equipment.

C. Submission Requirements:

1. Shop Drawings and Product Data:

   a. Refer to Division 01

2. Sample: Submit any samples required at the same time that shop drawings and product data are submitted.

D. It shall be the Contractor’s responsibility to:

1. See that all submittals are in proper order.
2. Ensure that all equipment will fit in the space provided.
3. Assure that all deviation from Drawings and Specification are specifically noted and called to the attention of the Engineer/Contracting Officer in the submittals. Failure to comply will void approval automatically.
4. Deviation, discrepancies, and conflicts between the submittals and the contract documents discovered prior to or after the review process shall not relieve the Contractor of this responsibility to comply with the contract documents.

1.13 START-UP:

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Agency's Representative seven days prior to start-up of each item.

C. Verify that each piece of equipment of system has been checked prior to start-up for proper lubrication, drive rotation, belt tension, control sequence, or other conditions, which may cause damage.

D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are completed and tested.

F. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

1.14 FEES, PERMITS AND INSPECTIONS: The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

1.15 DEFINITIONS

A. "Furnish: Means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.

B. "Install": Describes operations at project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

C. "Provide": Means to furnish and Install, complete and ready for intended use.

PART 2 - PRODUCTS

2.1 MATERIAL

A. All materials and products used for construction shall be new, of the best grade, and latest products as listed in printed catalog data. All articles of a kind shall be the standard product of a single manufacturer. Trade names and manufacturers names denote a character and quality of equipment desired and shall not be construed as limiting competition.

B. Asbestos: Do not use products made of or containing asbestos.

2.2 QUALITY ASSURANCE

A. Refer to Division 01 Material and Equipment for information regarding available alternatives to materials and equipment specified herein. Product listings are for informational purposes only and establish a general standard of quality.

B. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner characteristics and similar adaptations for the project.

2.3 BASIC FUNCTION

A. Provide electrical system capable of supplying power needs for building's mechanical and plumbing systems.

B. Provide means of artificial lighting as indicated in the Drawings or as otherwise directed by Agency and in accordance with all applicable codes, standards, and regulations.

2.4 OPERATION AND MAINTENANCE

A. Maintenance Access

1. All equipment shall be located to maintain ease of access.
2. Equipment utilities shall be routed to allow for access to equipment and replacement without removal of utilities.
3. Equipment shall be located in an area which will allow for complete removal and replacement without demolition to building infrastructure.
4. Provide access doors for access to all enclosed equipment.

PART 3 - EXECUTION

3.1 INSPECTION:

A. All work and materials are subject to field observation at any and all times by the Agency's Representative.

B. The Contractor shall notify the Agency's Representative a minimum of two days prior to testing any piping system which must be witnessed and accepted before it is covered up or enclosed.

C. Cover or otherwise suitably protect equipment and materials stored on the job site.

3.2 CLEANING

A. General: Clean electrical equipment, fixtures, piping of stampings and markings (except those required by codes), iron cuttings, and other refuse.

B. Painted Surfaces: Clean scratched or marred painted surfaces of rust or other foreign mater and paint with matching color industrial enamel, except as otherwise noted.

C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been

properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.

D. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.

3.3 LAYOUT AND COORDINATION

A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, roughing-in dimensions and equipment locations before proceeding with any of the work.

B. The existence of any wires, conduits, pipes, ducts or other service facilities is not necessarily shown. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.

C. The location of all utilities indicated on the plans is taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown may be present.

D. Sleeves, Insets, Cast-in-Place Work: provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.

E. Coordination:

1. Where the work must be sequenced and positioned with precision in order to fit into the available space, prepare accurate scale shop drawings showing the actual physical dimensions required for the installation and submit prior to purchase-fabrication-installation of any of the elements involved in the coordination.
2. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of electrical items.
3. Coordinate all work with other trades and determine in advance where interfacing of the electrical work and other work are required to be connected together. Provide all materials and equipment to make those connections. Submit shop drawings showing required connections where special conditions exist.

F. Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions. Do not proceed with any questionable

items of work until clarification of same has been made. Should rearrangement or re-routing of ducts or piping be necessary, provide for approval the simplest layout possible for that particular portion of the work.

3.4 TEMPORARY FACILITIES AND CONTROLS

A. Comply with Division 01 requirements.

B. Permanent electrical systems' equipment utilized for temporary facilities shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.

C. Agency's warranties shall not be abridged by Contractor's use of the permanent systems' equipment prior to final acceptance. Warranty period shall begin at final completion.

D. Maintain electric service to areas which are to remain in service during construction.

3.5 CLOSEOUT

A. General: Refer to the Division 01 sections for general closeout requirements. Calibrate all equipment requiring same.

B. Record Drawings: Submit record set of drawings required in Division 01, Submittals and as previously specified in this Section.

C. Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment and each system in a test run of appropriate duration with the Engineer present, and with the Agency's operating personnel present, to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty strainers, excessively worn parts and similar expendable items of the work.

D. Operation and Instruction: Provide up to eight (8) hours of on-site training to Agency's personnel on all electrical systems and equipment. Training shall include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system. Three (3) copies of written manuals shall be left with Agency at end of training.

END OF SECTION

SECTION 26 5000
LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Luminaires and lampholders.
2. Ballasts.
3. Lamps.
4. Emergency lighting equipment.

1.2 SUBMITTALS

A. Submit for:

1. Luminaires: Include electrical ratings, dimensions, mounting, material, required clearances, terminations, wiring and connection diagrams, photometric data, diffusers, and louvers.
2. Ballasts.
3. Lamps.
4. Emergency lighting equipment.

B. Provide the following operating and maintenance instructions from the manufacturer for project closeout, see Project Closeout Requirements in Division 1:

1. Luminaires.
2. Ballasts.
3. Lamps.
4. Emergency lighting equipment.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Provide luminaires acceptable to code authority for application and location as indicated.
2. Comply with applicable ANSI standards pertaining to lamp materials, lamp ballasts and transformers, and luminaires.
3. Comply with applicable NEMA standards pertaining to lighting equipment.
4. Provide luminaires and lampholders which comply with UL standards and have been UL listed and labeled for location and use indicated.
5. Comply with NEC 410 as applicable to installation and construction of luminaires.
6. Comply with fallout and retention requirements of UBC 52 for diffusers,

baffles, louvers, and the like.

1.4 WARRANTY

A. Ballast Manufacturer's Warranty: Not less than 2 years for magnetic type ballasts and 5 years for electronic type ballasts, based on date of manufacturer embossed on ballast, current with installation date. Warranty includes normal cost of labor for replacement of ballast.

B. LED Luminaire Warranty: The manufacturer shall provide a warranty against loss of performance and defects in materials and workmanship for the Luminaires for a period of 5 years after acceptance of the Luminaires. Replacement Luminaires shall be provided promptly after receipt of Luminaires that have failed at no cost to the customer. All warranty documentation shall be provided to customer prior to random sample testing.

C. Lamp Warranty: 5 years LED module, 30 days for incandescent, 6 months for compact fluorescent, 12 for fluorescent and HID lamps.

1.5 MAINTENANCE

A. Furnish 2 percent extra lens or louvers for each size and type of fluorescent luminaire.

B. Furnish 10 percent extra lamps for each size and type installed.

C. Furnish 5 percent extra ballasts for each size and type.

PART 2 - PRODUCTS

2.1 LUMINAIRE SCHEDULE

LOCATION	*MANUF.*	*MODEL*	*LUMENS*	*COLOR TEMP*	*DESCRIPTION*
RESTROOM BUILDING - INTERIOR	FAIL-SAFE	HVL12-4-LED4-3STD-40-UNV	6000-14000 lm	4000 K	SEE SECTION 2.2.A.1 LUMINAIRES
EXTERIOR SOFFIT	FAIL-SAFE	FLD4CX-15-D010	1500 lm	5000 K	SEE SECTION 2.2.A.2
EGRESS DOOR	ALEO	WPE-30 XE G3	4424 lm	5000 K	SEE SECTION 2.2.A.3

2.2 LUMINAIRES

A. Luminaires: Refer to Luminaire Schedule for basis of design manufacturer model number and other information. Descriptions below.

1. Vandal Resistant Linear LED - Aesthetically styled vandal resistant surface- or pendant-mount; Decorative end caps. Heavy duty extruded aluminum side rails for added protection; Die-Cast end caps. Clear linear

ribbed polycarbonate lens obscures lamp image, prisms inward; Opal optional
2. Vandal Resistant Sealed 4” Round Downlight - NSF rated for easy cleaning and wipe-down, Wet location standard (under covered ceiling), Choice of 6 reflector finishes, 90 or 97 CRI, glass or acrylic bottom lens.
3. Led wall pack, exterior building mount, rugged die-cast aluminum housing with advanced thermal management, weather-proof silicone gasketing, prismatic glass lens, dark bronze finish, integral photocell. UL listed wet locations. Type g with title 20 compliant emergency battery backup.

B. Where recessed luminaires are installed in cavities intended to be insulated, provide IC rated luminaires or other code approved installation.

C. Luminaires installed under canopies, roof or open porches and similar damp or wet locations, UL labeled as suitable for damp or wet locations.

D. Recessed Luminaires: Frame compatible with ceiling material installed at luminaire location. Provide proper trim, frame and modify luminaire to fit location and ceiling material.

E. Finishes:

1. Manufacturer's standard finish (unless otherwise indicated) over a corrosion resistant primer.
2. Interior Light Reflecting Finishes: White or specular finish with not less than 85 percent reflectance.
3. Exterior Finishes: As detailed in luminaire schedule or on Drawings. Refer cases of uncertain applicability to Engineer for resolution prior to release for fabrication.

F. Light Transmitting Components:

1. Plastic diffusers, molded or extruded of 100 percent virgin acrylic.
2. Prismatic acrylic, extruded, flat diffusers, 0.125-inch overall thickness, unless otherwise noted.

G. Fluorescent Luminaires:

1. Provide all open lamp fluorescent luminaires without diffusers or guards with turret type, spring loaded sockets.
2. To facilitate multilevel lamp switching, wire lamps within luminaire with outermost lamp at both sides of luminaire on the same ballast, the next inward pair on another ballast and so on to innermost lamp (or pair of lamps).
3. Provide wire lamp guards on all exposed lamp fluorescent luminaires.

H. LED Luminaires:

1. Each luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED

array, and electronic driver (power supply).

2. Each luminaire shall be rated for a minimum operational life of 50,000 hours as defined by IES LM-80 and TM-21.
3. Each luminaire shall be designed to operate at an average operating temperature of 25°C.

    a. The operating temperature range shall be -40°C to +40°C.
    b. Some parameters and tests (such as IESNA standard LM-80-08) shall be conducted at different ambient temperatures.

4. Each luminaire shall meet all parameters of this specification throughout the minimum operational life when operated at the average operating temperature.
5. The individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
6. Each luminaire shall be listed with a nationally recognized testing laboratory (including but not limited to UL, CSA, ETL) under UL 1598 and UL 8750, or an equivalent standard from a recognized testing laboratory.

2.3 BALLASTS

A. Ballasts, General:

1. Provide ballasts rated for specified lamps, i.e., T-8 or T-5 rated ballasts where T-8 or T-5 lamps specified.
2. Thermal Protection: Internal UL Class P with automatic reset.
3. Power Factors: Not less than 90 percent unless otherwise indicated.
4. Sound Ratings: Rating A, except where not available as standard products from any manufacturer. Provide quietest ratings available.
5. Input Voltage: Match branch circuit supply voltage; refer to Drawings.
6. Provide number of ballasts in luminaires to provide multilevel switching as indicated on Drawings.

B. Fluorescent Electronic Ballasts:

1. Provide ballasts which meet requirements of UL 935 and bear the appropriate UL label.
2. Electrical Characteristics:

    a. Provide electronic ballasts which withstand input power line transients as defined in ANSI C62.41, Category-A and IEEE 587. Ballasts tolerate a line voltage variation of plus or minus 10 percent.
    b. Power Factor: 95 percent or higher.
    c. Lamp Crest Factor: 1.7 or less for rapid start ballasts and 1.85 or less for instant start ballasts.
    d. Total Harmonic Distortion: Not to exceed 20 percent of the input current.
    e. Comply with FCC rules and regulations Part 18, Class A concerning generation of both electromagnetic interference and radio frequency interference.

f. Provide relative light output equal to electromagnetic ballasts in a 2-light lensed
g. Luminaire using energy saving ballasts and energy saving lamps. Average ballast factor (BF) is a minimum of 0.88.

3. Performance Characteristics:

a. Input Wattage: Not to exceed 85 percent of the value for their energy efficient core and coil counterparts.
b. Start and operate lamps at 50F and energy savings lamps at 60F. Ballast case temperature is 25C rise above a 40C ambient.
c. Provide constant light output throughout minimum input voltage variations of plus or minus 20 percent from nominal 120 volt or 277 volt.

4. Manufacturer: Advance RCN/VCN Series, Motorola, Magnetek, Universal, or approved.

C. HID Ballasts:

1. Provide minus 20F minimum starting temperature.
2. Constant wattage multitap autotransformer (CWA) types equal to Advance 73B Series except, high leakage-reactance high power factor (HX-HPF) equal to Advance 72C Series acceptable for up to 100 watt high pressure sodium lamp.
3. Provide ballasts for luminaires installed indoors, and where otherwise indicated, encapsulated core and coil type or otherwise specifically designed by manufacturer for quiet operation.

2.4 LAMPS

A. Provide lamps for all luminaires.

B. HID Lamps:

1. Where lamps are used in open luminaires, equip mercury vapor and metal halide luminaires with an integral approved shield or self-extinguishing lamps.
2. Lamps, coated or clear as recommended by luminaire manufacturer to provide for maximum luminaire efficiency in luminaire used. Provide color improved mercury or metal halide lamps for indoor areas.
3. For interior use, all metal halide lamps installed in a common area of building are of the same manufacturer's production run. Color discontinuities after initial "burn in" are unacceptable.
4. HID lamp types as specified in luminaire schedule. General Electric, Osram/Sylvania, Philips, Venture.

C. Fluorescent Lamps:

1. Unless otherwise noted, 3500K minimum CRI 80, length and wattage as

noted in luminaire schedule. General Electric, Osram/Sylvania, Philips.
2. Compact Fluorescent Lamps: Quad Tube, 3500K unless otherwise noted. General Electric, Osram/Sylvania, Philips.
3. Provide fluorescent lamps by same manufacturer General Electric, Osram/Sylvania, Philips.

D. LED

1. Light Output

a. The minimum initial lumen output of the luminaire shall be 3294 lumens exiting the luminaire in the 0-90 degree zone as measured by the IESNA Standard LM-79-08.
b. The Lumen output shall not decrease by more than 20% over the minimum operational life of the section 2.2 (or L80 shall be at least the minimum number of hours as specified in second 2.2)
c. The Measurements shall be calibrated to standard photopic calibrations.

2. Light Color/Quality.

a. Corrected Color temperature (CCT) range between 3,500K and 4,100K shall be correlated to chromaticity as defined by the absolute (X,Y) coordinates on the 2-D CIE chromaticity chart.
b. The color rendition index (CRI) shall be 80 or greater

2.5 EMERGENCY FLUORESCENT LAMP POWER SUPPLY

A. Manufacturers: Bodine, Iota, Lithonia.

B. Description: Self-contained battery-operated power supply for operating LED, one T8 or one compact fluorescent lamp for a minimum output of 90 minutes.

C. Provide access hatches, for emergency battery backup ballasts, adjacent to recessed 6-inch or less diameter downlights installed in inaccessible ceilings.

PART 3 - EXECUTION

3.1 COORDINATION

A. Verification of Conditions: Verify ceiling construction, recessing depth and other construction details prior to release of luminaire for shipment. Refer cases of uncertain applicability to Engineer for resolution prior to release of luminaires for shipment.

B. Provide all lighting indicated on Drawings with a luminaire of the type designated and appropriate for location. Where outlet symbols appear on Drawings without a type designation provide a luminaire the same as those used in similar or like locations.

3.2 INSTALLATION

A. Install luminaire of types indicated where shown and at indicated heights; in accordance with manufacturer's written instructions and with recognized industry practices; to ensure that luminaires comply with requirements and serve intended purposes.

B. Align, mount and level luminaires uniformly. Use ball hangers for suspended stem mounted luminaires.

C. Avoid interference with and provide clearance for equipment. Where indicated locations for luminaires conflict with locations for equipment, change locations for luminaire by minimum distance necessary as directed by Engineer.

D. Suspended Luminaires: Mounting heights indicate clearances between bottom of luminaire and finished floors.

E. Interior Luminaire Supports:

1. Support Luminaires: Anchor supports to structural slab or to structural members within a partition, or above a suspended ceiling.
2. Maintain luminaire positions after cleaning and relamping.
3. Support luminaires without causing ceiling or partition to deflect.

F. Wiring:

1. Recessed luminaires to be installed using flexible metallic conduit with luminaire conductors to branch circuit conductors in a nearby accessible junction box over ceiling. Junction box fastened to a building structural member within 6-feet of luminaire.
2. Install luminaires for lift-out and removal from ceiling pattern without disconnecting conductors or defacing ceiling materials.
3. Flexible connections where permitted to exposed luminaires; neat and straight, without excess slack, attached to support device.
4. Install junction box, flexible conduit and high temperature insulated conductors for through wiring of recessed luminaires.

G. Relamp luminaires which have failed lamps at completion of work.

3.3 ADJUSTING

A. Focus and adjust floodlights, spotlights and other adjustable luminaires, with Engineer, at such time of day or night as required.

B. Align luminaires that are not straight and parallel/perpendicular to structure.

3.4 CLEANING

A. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.

B. Where finish of luminaires has been damaged, touch up finish as directed by manufacturer's instructions.

END OF SECTION

SECTION 31 2316
EXCAVATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavating for footings, slabs-on-grade, and utilities within the building.

1.2 RELATED REQUIREMENTS

A. Section 01 7000 - Execution and Closeout Requirements: General requirements for dewatering of excavations and water control.

B. Section 31 2323 - Fill: Fill materials, filling, and compacting.

1.3 PROJECT CONDITIONS

A. Verify that survey benchmark and intended elevations for the Work are as indicated.

B. Contractor to perform all excavation required for the Work within a time period of 10 consecutive business days from commencement of excavation operations.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

3.2 EXCAVATING

A. Excavate to accommodate new structures and construction operations.

B. Notify Agency Project Manager of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

D. Cut utility trenches wide enough to allow inspection of installed utilities.

E. Hand trim excavations. Remove loose matter.

F. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by

volume.

G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2323.

H. Grade top perimeter of excavation to prevent surface water from draining into excavation.

I. Remove excavated material that is unsuitable for re-use from site.

J. Stockpile excavated material to be re-used in area designated on site.

K. Remove excess excavated material from site.

3.3 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

3.4 3.04 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 31 2323
FILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Filling, backfilling, and compacting for construction of this facility.

B. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.2 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.

1.3 REFERENCE STANDARDS

A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

1.4 SUBMITTALS

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

B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.

1.5 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where indicated.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
2. Prevent contamination.
3. Protect stockpiles from erosion and deterioration of materials.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. General Fill: Subsoil excavated on site, or imported borrow.

1. Graded.
2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

B. Structural Fill - As indicated in Drawings and Geotechnical Engineer's Report.

2.2 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

3.2 PREPARATION

A. Scarify subgrade surface to a depth of up to 24 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.3 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Fill up to subgrade elevations unless otherwise indicated.

C. Employ a placement method that does not disturb or damage other work.

D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen, or spongy subgrade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Structural Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth or as directed by Geotechnical Engineer's Representative and Report.

G. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

H. H. Correct areas that are over-excavated.

1. As directed by Geotechnical Engineer's Representative and Report. .

I. Compaction Density Unless Otherwise Specified or Indicated:

1. Under slabs-on-grade and similar construction: 95 percent of maximum dry density.
2. At other locations: 95 percent of maximum dry density.

J. Reshape and re-compact fills subjected to vehicular traffic.

3.4 FILL AT SPECIFIC LOCATIONS

A. Under building and water tower Slabs-On-Grade and Footings:

1. Use structural fill as directed by Geotechnical Engineer's Representative and Report.

B. Under Landscape Areas – See section 31 2000

3.5 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.

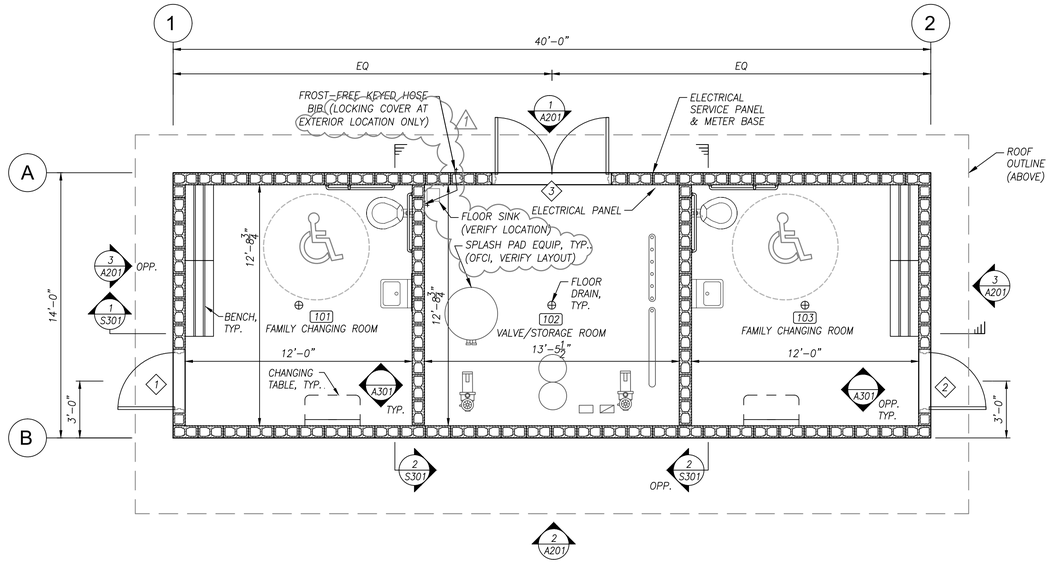
B. If tests indicate work does not meet specified requirements, remove work, replace and retest.

C. Frequency of Tests: As determined by Agency's testing agency.

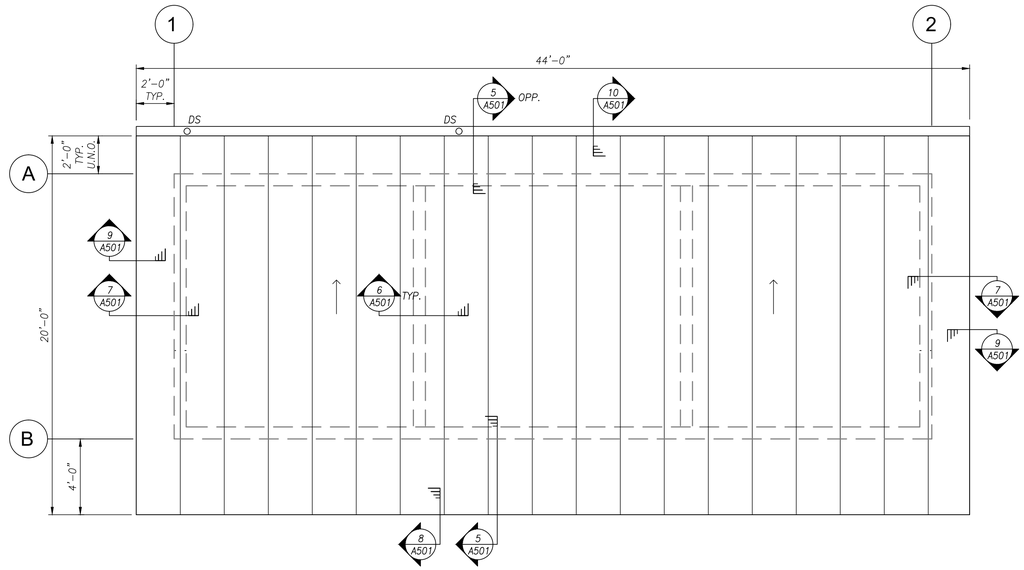
3.6 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

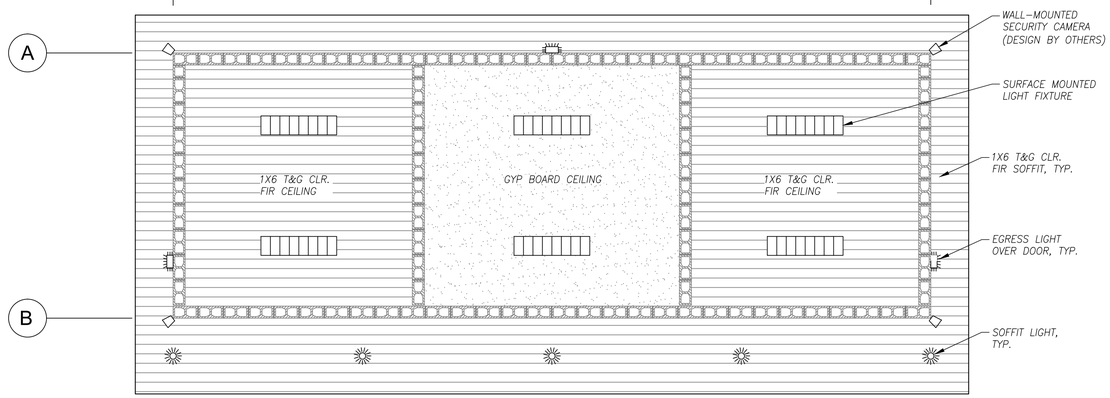
END OF SECTION



1 A101 **FLOOR PLAN**
SCALE: 1/4"=1'-0"



3 A101 **ROOF PLAN**
SCALE: 1/4"=1'-0"



2 A101 **REFLECTED CEILING PLAN**
SCALE: 1/4"=1'-0"

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REVISIONS:

No.	DESCRIPTION	DATE
1	ADDENDUM #1	4/18/24

CITY OF COTTAGE GROVE
BOHEMIA PARK EXPANSION

FLOOR PLAN

Sheet No. **A101**

DRAWN BY:	CHECKED BY:	DATE:
JLB	RH	4/10/24

JOB No. 22-001K

BUILDING ENVELOPE ENERGY COMPLIANCE

1. SEALING OF THE BUILDING ENVELOPE. OPENINGS AND PENETRATIONS IN THE BUILDING ENVELOPE SHALL BE SEALED WITH CAULKING MATERIALS OR CLOSED WITH GASKETING SYSTEMS COMPATIBLE WITH THE CONSTRUCTION MATERIALS AND LOCATION. JOINTS AND SEAMS SHALL BE SEALED IN THE SAME MANNER OR TAPED OR COVERED WITH A MOISTURE VAPOR-PERMEABLE WRAPPING MATERIAL. SEALING MATERIALS SPANNING JOINTS BETWEEN CONSTRUCTION MATERIALS ALLOW FOR EXPANSION AND CONTRACTION OF THE CONSTRUCTION MATERIALS.

2. WINDOW AND DOOR ASSEMBLIES. THE AIR LEAKAGE OF WINDOW AND SWINGING DOOR ASSEMBLIES THAT ARE PART OF THE BUILDING ENVELOPE SHALL BE DETERMINED IN ACCORDANCE WITH AAMA/WDMA/CSA 101/I.S.2/A440, OR NFRC 400 BY AS ACCREDITED INDEPENDENT LABORATORY, AND LABELED AND CERTIFIED BY THE MANUFACTURER.

3. BUILDING THERMAL ENVELOPE INSULATION. AN R-VALUE IDENTIFICATION MARK SHALL BE APPLIED (BY MANUFACTURER) TO EACH PIECE OF INSULATION 12" OR GREATER IN WIDTH. ALTERNATELY, THE INSULATION INSTALLERS SHALL PROVIDE A SIGNED, DATED AND POSTED CERTIFICATION LISTING THE TYPE, MANUFACTURER AND R-VALUE OF INSULATION INSTALLED. REFER TO CODE SECTION FOR BLOWN OR SPRAYED INSULATION INSTALLATION/SETTING DEPTHS AND MARKER REQUIREMENTS.

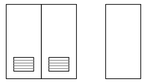
4. INSULATION MARK INSTALLATION. INSULATION MATERIALS SHALL BE INSTALLED SUCH THAT THE MANUFACTURER'S R-VALUE MARK IS READILY OBSERVABLE UPON INSPECTION.

5. INSULATION PRODUCT RATING. THE THERMAL RESISTANCE (R-VALUE) OF INSULATION SHALL BE DETERMINED IN ACCORDANCE WITH THE U.S. FTC R-VALUE RULE.

6. INSTALLATION. ALL MATERIAL, SYSTEMS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE INTERNATIONAL BUILDING CODE.

DOOR SCHEDULE

MARK	SIZE	SWING	FRAME	DOOR	TYPE	HARDWARE GROUP	REMARKS
1	3'-0" x 7'-0"	RH	HM	HM	B	2	
2	3'-0" x 7'-0"	LH	HM	HM	B	2	
3	6'-0" x 7'-0"	DBL	HM	HM	A	1	



TYPE A

TYPE B

HARDWARE SCHEDULE

	DESCRIPTION	PART #	QTY.	FINISH	VENDOR OR ALTERNATE
GROUP 1:	HINGE	5BB1HW 5 X 4.5 NRP X TORX	3 PER LEAF	630	IVES
	MORTISE DEADBOLT	11TC621-26 (DOUBLE CYLINDER)	1	626	MEDECO
	FINAL CORE	FURNISHED BY OWNER	1	626	MED
	PUSH PLATE	8200 6" X 16" X TORX	1	630	IVES
	PULL PLATE	8302-8 6" X 16" X TORX	1	630	IVES
	SURFACE CLOSER	4211 EDA SRI X TORX	1	689	LCN
	KICK PLATE	8400 12" X 2" LDW X TORX	2	630	IVES
	WALL STOP	WS401CCV	2	626	IVES
	SEALS	5050B (HEAD & JAMBS)	1 SET	BRN	NGP
	ASTRAGAL	BY HOLLOW METAL DOOR MANUF.	1	–	–
	MANUAL FLUSH BOLT	FB458	2	626	IVES
	DOOR SWEEP	200SSS	2	630	NGP
	THRESHOLD	896SS-SIA	1	630	NGP
GROUP 2:	HINGE	5BB1HW 5 X 4.5 NRP X TORX	3	630	IVES
	MORTISE DEADBOLT	11TC621-26 (DOUBLE CYLINDER)	1	626	MEDECO
	PRIVACY W/INDICATOR	L9496T 06A L583-363 X TORX	1	626	SCHLAGE
	PUSH PLATE	8200 6" X 16" X TORX	1	630	IVES
	PULL PLATE	8302-8 6" X 16" X TORX	1	630	IVES
	FINAL CORE	FURNISHED BY OWNER	1	626	MED
	CLOSER W/STOP	4211 CUSH SRI X TORX	1	689	LCN
	KICK PLATE	8400 12" X 2" LDW X TORX	1	630	IVES
	SEALS	5050B (HEAD & JAMBS)	1 SET	BRN	NGP
	DRIP CAP	16SS	1	630	NGP
	DOOR SWEEP	200SSS	1	630	NGP
	THRESHOLD	896SS-SIA	1	630	NGP

LEGEND:

CONC: EXPOSED CONCRETE FLOORS, SMOOTH FINISH W/ PAINT

PAINT: PAINT ON FINISHED & TEXTURED GYPSUM BOARD

FAC. FIN. FACTORY FINISH

WOOD: STAINED/SEALED T&G DECKING

ROOM FINISH SCHEDULE

RM	NAME	FLOOR	BASE	NORTH	EAST	SOUTH	WEST	CEILING	HEIGHT	NOTES
101	RESTROOM	CONC		PAINT	PAINT	PAINT	PAINT	WOOD	VARIES	
102	EQUIPMENT ROOM	CONC		FAC. FIN.	FAC. FIN.	FAC. FIN.	FAC. FIN.	PAINT	VARIES	
103	RESTROOM	CONC		PAINT	PAINT	PAINT	PAINT	WOOD	VARIES	

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REVISIONS:

No.	DESCRIPTION	DATE
1	ADDENDUM #1	4/18/24

CITY OF COTTAGE GROVE
BOHEMIA PARK EXPANSION

DOOR SCHEDULE & HARDWARE

Sheet No. A601

DRAWN BY: JLB | CHECKED BY: RH | DATE: 4/10/24

JOB No. 22-001K