

S P E C I F I C A T I O N S

FOR

**W2E WATER TREATMENT PLANT FOR:
ALBION – GRAYVILLE WATER DEPARTMENTS
2505 BROSTER ROAD
GRAYVILLE, ILLINOIS 62844**

OWNER

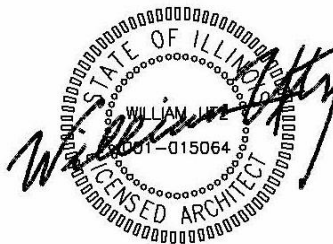
**W2E INC. c/o ALBION – GRAYVILLE WATER DEPARTMENTS
2505 BROSTER ROAD
GRAYVILLE, ILLINOIS 62844**

PROJECT NO. 25001



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**W2E Water Treatment Plant For:
Albion – Grayville Water Departments**

	<u>PAGE NO.</u>
<u>DIVISION 3 – CONCRETE</u>	
03353 Polished Concrete Work	03353 – 1-10
<u>DIVISION 4 – MASONRY</u>	
Section 04220 – Concrete Unit Masonry	04220 – 1-4
<u>DIVISION 5 – METALS</u>	
Section 05500 – Miscellaneous Metals	05500 – 1
<u>DIVISION 6 – WOOD & PLASTICS</u>	
Section 06410 – Laminate Casework	06410 – 1-2
<u>DIVISION 7 – THERMAL & MOISTURE PROTECTION</u>	
Section 07210 – Building Insulation	07210 – 1-2
Section 07211 – Perimeter Insulation	07211 – 1-2
Section 07840 – Firestopping	07840 – 1
Section 07920 – Sealants & Caulking	07920 – 1-2
<u>DIVISION 8 – DOORS & WINDOWS</u>	
Section 08110 – Steel Doors & Frames	08110 – 1-2
Section 08360 – Upward Acting Doors	08360 – 1-2
Section 08410 – Aluminum Doors, Frames & Hardware	08410 – 1-3
Section 08710 – Finish Hardware	08710 – 1-3
Section 08720 – Finish Hardware Schedule	08720 – 1-2
Section 08810 – Glass & Glazing	08810 – 1-2
<u>DIVISION 9 - FINISHES</u>	
Section 09250 – Gypsum Wallboard	09250 – 1-3
Section 09310 – Ceramic Tile	09310 – 1-2
Section 09510 – Acoustical Ceilings	09510 – 1-2
Section 09910 – Painting	09910 – 1-3
<u>DIVISION 10 – SPECIALTIES</u>	
Section 10440 – Signage	10440 – 1-2
Section 10810 – Toilet Accessories	10810 – 1-2
Section 10732 – Suspended Canopies	10732 – 1-2
<u>DIVISION 13 – SPECIAL CONSTRUCTION</u>	
Section 13120 – Pre-Engineered Metal Building System	13120 – 1-7

PART 1 – GENERAL

1.01 SUMMARY.

- A. Section Includes: Products and procedures for coloring and bonded abrasive polishing concrete floors using multi-step wet/dry mechanical process, and accessories indicated, specified, or required to complete polishing.

1.02 DEFINITIONS

- A. Terminology: As defined by CPAA.
- B. Polished Concrete: The act of changing a concrete floor surface, with or without aggregate exposure, to achieve a specified level of gloss.
- C. Bonded Abrasive Polished Concrete: The multi-step operation of mechanically grinding, honing, polishing of a concrete floor surface with bonded abrasives to cut a concrete floor surface and to refine each cut to the maximum potential to achieve a specified level of finished gloss as defined by the CPAA. This yields the most durable finish and requires the least amount of maintenance.

1.03 SUBMITTALS

- A. Product Data: Manufacturer’s technical literature for each product indicated, specified, or required. Include manufacturer's technical data, application instructions, and recommendations.
- B. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 “Quality Assurance” Article.
- C. Field Quality Control – Dynamic Coefficient of Friction Test Reports: Reports of testing specified in PART 3 “Field Quality Control” Article.
- D. Field Quality Control – Static Coefficient of friction test reports: report of testing specified in Part 3 “Field Quality Control” article.
- E. Maintenance Data: For inclusion in maintenance manual required by Division 01.

Include instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.

Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

1.04 QUALITY ASSURANCE

- A. Polisher Qualifications:
 - 1. Experience: Company experienced in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

2. Supervision: Maintain competent supervisor who is at Project during times specified work is in progress, and is currently certified as Craftsman - Level I or higher by CPAA.
 3. Manufacturer Qualification: Approved by manufacturer to apply liquid applied products.
- B. Walkway Auditor: Certified by CPAA or NFSI to test bonded abrasive polished concrete floors for dynamic and static coefficient of friction according to ANSI B101.1 and B101.3.
- C. Coefficient of Friction: Achieve following coefficient of friction by field quality control testing in accordance to the following standards:
1. ANSI B101.1 Static Coefficient of Friction - Achieve a minimum of .42 for level floor surfaces.
 2. ANSI B101.3 Dynamic Coefficient of Friction - Achieve a minimum of .35 for level floor surfaces.
- D. Field Mock-up: Before performing work of this Section, provide following field mock-up to verify selections made under submittals and to demonstrate aesthetic effects of polishing. Approval does not constitute approval of deviations from Contract Documents, unless Architect specifically approves deviations in writing.
1. Form, reinforce, and cast concrete slab for 10 foot square field mock-up.
 2. Concrete shall be same mix design as scheduled for Project.
 3. Placement and finishing work shall be performed by same personnel as will place and finish concrete for Project.
 4. Mock-up shall be representative of work to be expected.
 5. Perform grinding, honing, and polishing work as scheduled for Project using same personnel as will perform work for Project.
 6. Approval is for following aesthetic qualities:
 - a. Compliance with approved submittals.
 - b. Compliance with specified aggregate exposure.
 - c. Compliance with specified finished gloss level.
 - d. Compliance with specified color.
 7. Obtain Architect's approval before starting work on Project.
 8. Protect and maintain approved field mock-ups during construction in an undisturbed condition as a standard for judging completed work.
- E. Pre-Installation of Concrete Conference: Prior to placing concrete for areas scheduled for polishing, conduct conference at Project to comply with requirements of applicable Division 01 Sections.
1. Required Attendees:
 - a. Owner.

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

- b. Architect.
 - c. Contractor, including supervisor.
 - d. Concrete producer.
 - e. Concrete finisher, including supervisor.
 - f. Concrete polisher, including supervisor.
 - g. Technical representative of liquid applied product manufacturers.
 - h. Walkway auditor.
2. Minimum Agenda: Polisher shall demonstrate understanding of work required by reviewing and discussing procedures for, but not limited to, following:
- a. Tour field mock-up and representative areas of required work, discuss and evaluate for compliance with Contract Documents, including substrate conditions, surface preparations, sequence of procedures, and other preparatory work performed by other installers.
 - b. Review Contract Document requirements.
 - c. Review approved submittals and field mock-up.
 - d. Review procedures, including, but not limited to:
 - 1) Applicable Division 03 Section on cast-in-place concrete
 - a. Specific mix design.
 - b. Specified curing methods/procedures.
 - c. Projected 3, 10, and 28 day compression strength test related to specified aggregates exposure for finished floor and project phasing.
 - d. Protection of concrete substrate during construction and prior to polishing process
 - e. Project phasing and scheduling for each step of grinding, honing and polishing operations including, but not limited to:
 - i. Quality of qualified personnel committed to project.
 - ii. Quality and size of grinders committed to project.
 - iii. Proper disposal of concrete slurry and/or concrete dust.
 - f. Details of each step of grinding, honing, and polishing operations.
 - i) Application of color.

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

- ii) Application of liquid applied products.
 - iii) Protecting polished concrete floors after polishing work is complete.
3. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party attending.

1.05 FIELD CONDITIONS

- A. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.
- 1. Prohibit use of markers, spray paint, and soapstone.
 - 2. Prohibit improper application of liquid membrane film forming curing compounds.
 - 3. Prohibit vehicle parking over concrete surfaces.
 - 4. Prohibit pipe-cutting operations over concrete surfaces.
 - 5. Prohibit storage of any items over concrete surfaces for not less than 28 days after concrete placement.
 - 6. Prohibit ferrous metals storage over concrete surfaces.
 - 7. Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces.
 - 8. Protect from acids and acidic detergents contacting concrete surfaces.
 - 9. Protect from painting activities over concrete surfaces.
- B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting liquid applied product application.

PART 2 – PRODUCTS

2.01 LIQUID APPLIED PRODUCTS

- A. Liquid Densifier: An Aqueous solution of Silicon Dioxide dissolved in one of the following Hydroxides that penetrates into the concrete surface and reacts with the Calcium Hydroxide to provide a permanent chemical reaction that hardens and densifies the wear surface of the cementitious portion of the concrete. All of the following have the same chemistry varying only by the alkali used for solubility of the Silicon Dioxide.
- 1. Sodium Silicate
 - 2. Potassium Silicate
 - 3. Lithium Silicate
 - 4. Alkalis solution of Colloidal Silicates or Silica

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

- B. Dye: Non-film forming soluble colorant dissolved in a carrier designed to penetrate and alter coloration and appearance of a concrete floor surface without a chemical reaction.
- C. Pigmented Micro Stains: Fine pigment particles ($<3.9 \times 10^{-4}$ inches) suspended in
- D. Water-based silicate solution that penetrates concrete and reacts with calcium hydroxide to lock in color particles.
- E. Sealer - Impregnating Stain Protection: Non film forming stain and food resistant penetrating sealer designed to be applied to densified and polished concrete which meets the requirements of OSHA for slip resistance as tested by ASTM D 2047 and stain resistance of ASTM D 1308.

2.02 ACCESSORIES

- A. Repair Material: A product that is designed to repair cracks and surface imperfections. The specified material must have sufficient bonding capabilities to adhere after the polishing to the concrete surface and provide abrasion resistance equal to or greater than the surrounding concrete substrate.
- B. Grout Material: A thin mortar used for filling spaces. Acceptable products shall be:
 - a. Epoxy, urethane, polyurea, or polyaspartic resins.
 - b. Latex or acrylic binders mixed with cement dust from previous grinding steps.
 - c. Silicate binders mixed with cement dust from previous grinding steps.
- C. Protective Cover: Non-woven, puncture and tear resistant, polypropylene fibers laminated with a multi-ply, textured membrane, not less than 18 mils in thickness.

2.03 POLISHING EQUIPMENT

- A. Field Grinding and Polishing Equipment:
 - 1. A multiple head, counter rotating, walk behind or ride on machine, of various size and weights, with diamond tooling affixed to the head for the purpose of grinding concrete. Excludes janitorial maintenance equipment.
 - 2. If dry grinding, honing, or polishing, use dust extraction equipment with flow rate suitable for dust generated, with squeegee attachments.
 - 3. If wet grinding, honing, or polishing, use slurry extraction equipment suitable for slurry removal and containment prior to proper disposal.
- B. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produces same results, without noticeable differences, as field grinding and polishing equipment.
- C. Burnishing Equipment: High speed walk-behind or ride-on machines capable of generating 1000 to 2000 revolutions per minute and with sufficient head pressure of not less than 20 pounds to raise floor temperature by 20 degrees F.
- D. Diamond Tooling: Abrasive tools that contain industrial grade diamonds within a bonded matrix (such as metallic, resinous, ceramic, etc) that are attached to rotating heads to refine the

concrete substrate.

1. **Bonded Abrasive:** Abrasive medium that is held within a bonding that erodes away to expose new abrasive medium as it is used.
2. **Metal Bond Tooling:** Diamond tooling that contains industrial grade diamonds with a metallic bonded matrix that is attached to rotating heads to refine the concrete substrate. These tools are available in levels of soft, medium, and hard metallic matrices that are matched with contrasting concrete substrates (i.e. hard matrix/soft concrete, medium matrix/medium concrete, soft matrix/hard concrete) and are typically used in the grinding and early honing stages of the polishing process.
3. **Resin Bond Tooling:** Diamond tooling that contains industrial grade diamonds within a resinous bonded matrix (poly-phenolic, ester-phenolic, thermoplastic-phenolic) that is attached to rotating heads to refine the concrete substrate. Resin bond tooling does not have the soft/medium/hard characteristics of metal bond tooling and are typically used for the later honing and polishing stages of the polishing process.
4. **Hybrid Tooling:** Diamond tooling that combines metal bond and resin bond that has the characteristics of both types of tooling. These types of tools are typically used as either transitional tooling from metal bond tools to resin bond tools or as a first cut tool on smooth concrete surfaces.
5. **Transitional Tooling:** Diamond tooling that is used to refine the scratch pattern of metal bond tooling prior to the application of resin bond tooling in an effort to extend the life of resin bond tooling and to create a better foundation for the polishing process.
6. **Abrasive Pad:** An abrasive pad, resembling a typical floor maintenance burnishing pad, that has the capability of refining the concrete surface on a microscopic level that may or may not contain industrial grade diamonds. These pads are typically used for the maintenance and/or restoration of previously installed polished concrete flooring.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Acceptance of Surfaces and Conditions:

1. Examine substrates to be polished for compliance with requirements and other conditions affecting performance.
 - a. Concrete Finished Floor Flatness according to applicable Division 03 Section on cast-in-place concrete.
 - b. Concrete curing methods according to applicable Division 03 Section on cast-in-place concrete.
 - c. Concrete Compression strength per according to applicable Division 03 Section on cast-in-place concrete.

B. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.

C. Starting work within a particular area will be construed as acceptance of surface conditions.

3.02 PREPARATION

A. Cleaning New Concrete Surfaces:

1. Prepare and clean concrete surfaces.
2. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

3.03 VAPOR TESTING CONCRETE FLOORS

A. Alkalinity:

1. Test Method: Measure pH according to method indicated in ASTM F 710.
2. Acceptable Results: pH between 8 and 10.

B. Moisture Vapor Transmission Rate:

1. Test Method: Perform anhydrous calcium chloride test according to ASTM F 1869.
2. Acceptable Results: Not more than 5 pounds per 1000 square feet in 24 hours.

C. Relative Humidity:

1. Test Method: Perform relative humidity test using in situ probes according to ASTM F 2170.
2. Acceptable Results: Not more than 75 percent.

3.04 COLORING CONCRETE FLOORS

A. Dye or Pigmented Micro Stain Application:

1. Apply solution by methods and techniques required by manufacturer to produce finish matching approved field mock-ups.
2. Maintain wet edge, working newly applied solution into edges of adjacent wet edges of previously treated surfaces.
3. Maintain consistent saturation throughout application.
4. Avoid splashing, dripping, or puddling of solution on adjacent substrates.
5. When color matches approved mock-ups, neutralize as required by manufacturer.

3.05 POLISHING CONCRETE FLOORS

A. Perform all polishing procedures to ensure a consistent appearance from wall to wall.

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

B. Initial Grinding:

1. Use grinding equipment with metal or semi-metal bonded tooling.
2. Begin grinding in one direction using sufficient size equipment and diamond tooling to meet specified aggregate exposure class.
3. Make sequential passes with each pass perpendicular to previous pass using finer grit tool with each pass, up to 100 grit metal bonded tooling.
4. Achieve maximum refinement with each pass before proceeding to finer grit tools.
5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
6. Continue grinding until aggregate exposure matches approved field mock-ups.

C. Treating Surface Imperfections:

1. Mix patching compound or grout material with dust created by grinding operations, manufacturer's tint, or sand to match color of adjacent concrete surfaces.
2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids with grout to eliminate micro pitting in finished work.
3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not reasonably noticeable when viewed from 10 feet away under lighting conditions that will be present after construction.

D. Liquid Densifier Application: Apply undiluted to point of rejection, remove excess liquid, and allow curing according to manufacturer's instructions.

E. Grout Grinding:

1. Use grinding equipment and appropriate grit and bond diamond tooling.
2. Apply grout, forced into the pore structure of the concrete substrate, to fill surface imperfections.
3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.

F. Honing:

1. Use grinding equipment with hybrid or resin bonded tooling.
2. Hone concrete in one direction starting with a 100 grit tooling and make as many sequential passes as required to remove scratches, each pass perpendicular to previous

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

pass, up to 400 grit tooling reaching maximum refinement with each pass before proceeding to finer grit tooling.

3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.

G. Polishing:

1. Use polishing equipment with resin-bonded tooling.
2. Begin polishing in one direction starting with 800 grit tooling.
3. Make sequential passes with each pass perpendicular to previous pass using finer grit tooling with each pass until the specified level of gloss has been achieved.
4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
6. Stain Protection: Uniformly apply and remove excessive liquid according to manufacturer's instructions. Final film thickness should be less than .05 mils after cure.
7. Final Polish: Using burnishing equipment and finest grit abrasive pads, burnish to uniform reflective sheen matching approved field mock-up.

H. Final Polished Concrete Floor Finish:

1. Aggregate Exposure Class B – Fine / Sand Aggregate Finish: Remove not more than 1/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with no, or small amount of, medium aggregate at random locations.
2. Finished Gloss Level 3 – High Gloss Appearance:
 - a. Procedure: Recommended not less than 4 steps with full refinement of each diamond tool with one application of densifier.
 - b. Gloss Measurement: Determine the specular gloss by incorporating the following:
 - 1.) Reflective Clarity Reading: Not less than 65 according to ASTM D5767 prior to the application of sealers.
 - 2.) Reflective Sheen Reading: Not less than 35 according to ASTM D523 prior to the application of sealers.

3.06 FIELD QUALITY CONTROL

- A. Field Testing: Engage a qualified walkway auditor to perform field testing to determine if polished concrete floor finish complies with specified coefficient of friction;

DIVISION 3 – CONCRETE
Section 03353 – Polished Concrete Work

1. ANSI B101.1 for static coefficient of friction
2. ANSI B101.3 for dynamic coefficient of friction

3.07 CLOSEOUT ACTIVITIES

- A. Maintenance Training: CPAA Craftsman shall train Owner's designated personnel in proper procedures for maintaining polished concrete floor.

3.08 PROTECTION

- A. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.

END SECTION 03353

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, materials, equipment, and services necessary to construct all items of Brick Veneer indicated on the drawings and as specified herein.

1.02 CONNECTING WORK

- A. This Contractor shall consult the plans, details, and specifications of other Contractors having work in conjunction with the masonry and notify them of his proposed schedule for the work on various portions of the building. This Contractor shall provide sufficient notice to allow the various trades to complete their work without causing undo conflict or delay in the progress of the work.

1.03 SCAFFOLDING

- A. This contractor shall furnish and maintain all scaffolding required for the safe and proper installation of his work.

1.04 STORAGE & HANDLING

- A. Store masonry units off ground on level platforms or pallets which allow air circulation under stacked units and prevent absorption of moisture. Cover and protect against the elements.
- B. Store cement, lime, and mortar in protected areas elevated off ground.
- C. Protect anchors, ties, reinforcing and insulating materials from the elements to prevent rusting or deteriorating.

1.05 PROTECTION OF MASONRY

- A. Cover the top of all masonry construction at the end of each days work or when weather conditions become threatening. Cover with polyethylene sheet, waterproof-reinforced paper, or oiled canvas, weighted properly to hold in place.
- B. Do not lay masonry in freezing weather unless approved adequate means are used to prevent freezing. If temperature is below 40 degrees F, mortar materials shall be heated to not over 120 degrees F or lower than 70 degrees F and the brick or concrete masonry heated to prevent sudden cooling of the mortar.
- C. Cover with tarpaulin or sheet plastic and heat both sides of wall in extreme weather.
- D. Protect from freezing for at least forty-eight (48) hours after being laid. Protect all work as necessary against soiling and damage.
- E. Any frozen masonry shall be completely removed, discarded, and replaced with new construction as soon as discovered.

1.06 CLEAN-UP

- A. The Masonry Contractor shall be responsible for keeping the job site free of unnecessary clutter, and shall place his debris in a common pile to be removed at the conclusion of his work.

PART 2 – PRODUCTS

2.01 MASONRY MATERIALS

A. Utility Face Brick:

- 1. Utility Face Brick shall be selected by the Architect from samples furnished by the Contractor. Brick shall be stockpiled on the job site in sufficient number to complete the entire job. Manufacturer shall see that color runs uniformly throughout the building with no definite lines of change in color.
- 2. Contractor shall use an allowance of \$2,000.00 per thousand for standard modular face brick delivered to the job site in preparing his bid. This allowance shall cover the purchase price of the brick delivered to the job site, and all other cost shall be included in the Contractor's bid. The contract price shall be adjusted by change order to reflect the actual cost of the brick, based on the final unit cost and quantity of brick used.
- 3. Face brick shall conform to ASTM C216 severe weathering (SW) brick.

B. Limestone:

- 1. Limestone shall be Indiana Oolitic Limestone building stock, and shall be free of defects that would materially impair its strength, durability, or appearance.

C. Brick Veneer Anchors:

- 1. Brick Veneer Anchors shall be Type D/A CWT as manufactured by Dur-O-Wal, Inc., Arlington Heights, Illinois. Anchors shall be attached to steel studs with Type D/A 807 screws, or to wood studs with Type D/A 808 screws. Brick anchors shall be hot dipped galvanized.

D. Weep Holes:

- 1. Weep Holes shall be Type D/A 1005 standard 3/8" diameter x 3 1/2" long clear plastic tubes, as manufactured by Dur-O-Wal, Inc., Arlington Heights, Illinois.

E. Expansion Joints:

- 1. Expansion Joints shall be constructed using Rapid Expansion Joint, 3/8" thick, as manufactured by Dur-O-Wal, Inc., Arlington Heights, Illinois.

F. Mortar Materials:

1. Portland Cement shall conform to ASTM C-150-47, Type 1.
2. Lime shall be equal to "Mortaseal", as manufactured by United States Gypsum Company, conforming to ASTM C-207-49, Type S. (2% hydrated). Lime may be used immediately after mixing.
3. Sand shall conform to ASTM C-144-44, aggregate for masonry mortar.
4. Water used in mixing shall be clean and free from acids, alkalines, or organic materials.
5. At the Contractor's option, mortar may be a prepared masonry mortar as manufactured by Marquette, Brixment, Alpha, or Leigh.

G. Mortar Mix:

1. At locations above or below grade, mortar materials complying with the above referenced specifications, shall be mixed in the proportion of one (1) bag Portland Cement, one (1) bag lime, and not more than six (6) cu.ft. sand. (1:1 1/4:6 by volume), or
2. One bag masonry cement to three cu.ft. sand (1:3)

H. Mortar Color:

1. Mortar color shall be used in all exposed brick masonry. Mortar color shall be as manufactured by Brixment or Solomon Grind - Chem, Inc. Mortar samples shall be prepared and laid in panels of approximately 12 brick per sample for selection by the Architect.

I. Foundation Damp Proofing:

1. The top of all foundation walls, as detailed on the drawings, shall be coated with a heavy, brushed on, coating of Karnak "83" Damp proofing, or equal. The purpose of this coating is to prevent capillary action from the ground.

J. Flashing:

1. Membrane flashing shall be Nervastral Seal-Pruf H-D Flashing, as manufactured by Nervastral, Inc. Flashing shall be adhered in place, and all joints shall be sealed with adhesive as recommended by the manufacturer.
2. Flashing shall be installed continuously at all weep holes, and cemented in place. Refer to details for flashing application. Provide weep holes in face brick at 32" on center, in the first brick course above the membrane flashing.
3. Install membrane flashing over all steel lintels in exterior walls and cement in place. Provide weep holes above the flashing.

PART 3 – EXECUTION

3.01 INSTALLATION – FACE BRICK

- A. Face brick shall be laid with running bond and shall have all joints tooled with a long jointer. Where necessary in exposed work the face brick shall be saw cut to keep vertical joints in line and present a neatly laid wall.
- B. All head joints shall be made full as the brick is laid in place in such a manner that it is unnecessary to slush the joints from the top.
- C. Brick shall be laid 3 courses and 3 joints to 8".
- D. Brick veneer shall be anchored to frame construction with galvanized brick anchors placed at 16" o.c. horizontally and vertically, and attached to wood studs with galvanized screws.
- E. Provide sealant joints, ¼ inch wide by ¾ inch deep, around outside perimeters of exterior wall openings to receive caulking.
- F. Weep holes shall be provided in first course of brick above finish grade by omitting head joints at 2'-9" on center, in first course above membrane flashing.
- H. Keep space between brick veneer and wall sheathing clear of mortar droppings.
- I. Provide Nervastral Seal-Pruf H-D flashing at bottom of brick veneer, and over steel lintels, as detailed on drawings.
- J. All joints shall be well bedded and the exposed surfaces neatly pointed with long tool.

3.02 FLASHING

- A. Flashing material and flashing at weep holes shall be Nervastral Seal-Pruf H-D Flashing. Cement all flashing in place with mastic as recommended by the manufacturer. Extend flashing 6" each side of the opening and use vertical folds to prevent leakage at flashing ends. See details for continuous flashing at weep holes in brick veneer.

3.03 CONTROL JOINTS

- A. Construct control joints in masonry consisting of vertical joints with joint backing within ½" of the face, and the joint caulked with sealant to match color of mortar. See Section 07920 - Sealants and Caulking for caulking materials.
- B. Control joints shall be located where indicated on the drawings, and where job conditions require vertical control joints.

3.04 LINTELS

- A. The lintels over all openings in masonry walls shall be steel, as detailed on the drawings. The masonry contractor shall set all loose lintels and bearing plates that may be supplied by others. All steel lintels shall be flashed w/Nervastral Seal Pruf HD flashing. Flashing shall extend up and out

behind building wrap and over lintel. Fold up ends of flashing & provide weepholes similar to above.

3.05 CLEANING MASONRY

- A. All masonry surfaces shall be dry brushed with stiff bristled (not metal) brushes after mortar has set at end of each day's work and after final pointing of holes and joints.
- B. Point all holes in exposed masonry joints with mortar and tool to match surrounding work.
- C. Masonry surfaces shall be cleaned with a mild muriatic acid solution applied with brush, and thoroughly rinsed with clean water.
- D. Protect all glass, metal and other finish materials, subject to damage from contact with cleaning agents while cleaning masonry. Keep walls below areas being cleaned with acid base cleaning agents soaked with water at all times cleaning is in progress.
- E. When masonry work is done, clean any spilled mortar or concrete from brick, blocks, concrete walks and other adjacent surfaces. Use diluted muriatic acid to remove concrete or mortar from brick if necessary. Architect shall be sole judge as to cleanliness.

END SECTION 04210

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, materials, equipment, and services necessary to construct all items of Concrete Masonry as indicated on the drawings and as herein specified.

1.02 CONNECTING WORK

- A. This Contractor shall consult the plans, details, and specifications of other Contractors having work in connection with the masonry and notify them of his proposed schedule for the work on various portions of the building. This Contractor shall provide sufficient notice to allow the various trades to complete their work without causing undo conflict or delay in the progress of the work.

1.03 SCAFFOLDING

- A. This Contractor shall furnish and maintain all scaffolding required for the safe and proper installation of his work.

1.04 STORAGE & HANDLING

- A. Store masonry units off ground on level platforms or pallets which allow air circulation under stacked units and prevent absorption of moisture. Cover and protect against the elements.
- B. Store cement, lime, and mortar in protected areas elevated off ground.
- C. Protect anchors, ties, reinforcing and insulating materials from the elements to prevent rusting or deteriorating.

1.05 PROTECTION OF MASONRY

- A. Cover the top of all masonry construction at the end of each day's work or when weather conditions become threatening. Cover with polyethylene sheet, waterproof-reinforced paper, or oiled canvas, weighted properly to hold in place.
- B. Do not lay masonry in freezing weather unless approved adequate means are used to prevent freezing. If temperature is below 40 degrees F, mortar materials shall be heated to not over 120 degrees F or lower than 70 degrees F and the concrete masonry units heated to prevent sudden cooling of the mortar.
- C. Cover with tarpaulin or sheet plastic and heat both sides of wall in extreme weather.
- D. Protect from freezing for at least forty-eight (48) hours after being laid. Protect all work as necessary against soiling and damage.
- E. Any frozen masonry shall be completely removed, discarded, and replaced with new construction as soon as discovered.

PART 2 – PRODUCTS

2.01 MASONRY MATERIALS

A. Masonry Block Units:

1. Limestone Concrete Block:

- a. Limestone Concrete Blocks shall be Type 1, Grade N Concrete Blocks, two or three core, hollow, load bearing type in standard modular sizes as indicated on the drawings. They shall be good quality, straight and true, and without chipped corners or edges on the exposed surface. Units shall be steam cured for a minimum of 24 hours, and shall have a minimum compressive strength of one thousand pounds (1,000 lbs.) per square inch gross area at 28 days. When immersed in water for twenty-four hours, the absorption shall not be more than ten pounds per cubic foot.

B. Mortar Materials:

1. Portland Cement shall conform to ASTM C-150-47, Type 1.
2. Lime shall be equal to “Mortaseal”, as manufactured by United States Gypsum Company, conforming to ASTM C-207-49, Type S. (2% hydrated) Lime may be used immediately after mixing.
3. Sand shall conform to ASTM C-144-44, aggregate for masonry mortar.
4. Water used in mixing shall be clean and free from acids, alkalies, or organic materials.
5. At the Contractor’s option, mortar may be a prepared masonry mortar as manufactured by Marquette, Brixment, Alpha, or Leigh.

C. Mortar Mix:

1. At locations above or below grade, mortar made from materials complying with the above mentioned specifications, shall be mixed in the proportion of one (1) bag Portland Cement, one (1) bag lime, and not more than six (6) cu.ft. sand. (1:1 1/4:6 by volume) or
2. One bag masonry cement to three cu.ft. sand (1:3).

D. Horizontal Masonry Reinforcement:

1. Provide and install horizontal mesh reinforcement designed for single wythe wall construction, by the following manufacturer, or approved equal;

Dur-o-Wal, Inc.
601 North Point Road
Baltimore, Maryland 21237

2. Design shall be Dur-O-Wal “Ladur” style reinforcing for single wythe construction.
3. Reinforcing shall be galvanized standard class with #9 side rods and #9 cross rods spaced 15” o.c. Provide pre-manufactured sections at all corners and wall intersections.

DIVISION 4 – MASONRY
Section 04220 – Concrete Unit Masonry

4. Provide additional horizontal reinforcement in bond beams and other locations where specifically detailed on the drawings. Bond beams shall be slushed solid with 3000 psi concrete.
- E. Vertical Masonry Reinforcement:
1. Provide and install vertical reinforcement in masonry walls where indicated.
 2. Vertical reinforcement shall be deformed steel reinforcing bars, #4 unless otherwise indicated.
 3. Reinforcing bars shall be lapped 12” at splices, and wire tied.
 4. Reinforcing shall extend full height of wall, and cores around bars shall be grouted full with 3,000 psi pea concrete.
- F. Control Joints:
1. Control joints shall be constructed as indicated using “Rapid Control Joint” as manufactured by Dur-O-Wal, Inc., or equal performed rubber joint to fit in sash groove of concrete sash block.
 2. Construct masonry control joints, as indicated, and in such locations, as shown on the plans or as directed by the Architect where a job site condition warrants.

PART 3 – EXECUTION

3.01 LAYING MASONRY

- A. All concrete block masonry shall be laid in running bond, and reinforced with reinforcing mesh at 1'-4" on center beginning with the top of the first concrete block course above the foundation.
- B. Install additional vertical reinforcing bars of size and spacing as indicated on the drawings. Fill voids solid with mortar around vertical reinforcing.
- C. Where necessary to cut block the units shall be saw cut with masonry blade.
- D. Fill all voids solid in masonry block where indicated on the drawings.
- E. All mortar joints shall be full without gaps or voids. All exposed surfaces of block shall have joints pointed with a long tool having a concave face. Unexposed surfaces of block shall have joints cut flush with surface of block.

3.02 BOND BEAMS

- A. Construct bond beams using bond beam blocks of sizes and locations indicated on the drawings. Bond beams shall be filled with concrete with pea gravel aggregate, and reinforced with continuous reinforcing steel of sizes indicated on the details.

3.03 FOUNDATION DAMP PROOFING

DIVISION 4 – MASONRY
Section 04220 – Concrete Unit Masonry

- A. The top of all foundation walls, as detailed on the drawings, shall be coated with a heavy, brushed on, coating of Karnak “83” damp proofing. The purpose of this coating is to prevent capillary action from the ground.

3.04 ACCESSORY ITEMS

- A. Build in all items specified in this or other sections of the specifications or as detailed on the drawings such as anchor bolts, inserts, lintels, chases, flashing, etc. Consult with other trades to determine the proper locations of all necessary items as may be necessary to complete the masonry work.

3.05 PRECAUTIONS

- A. Masonry walls shall be adequately covered at the end of each day's work and at all times when work is not in progress.
- B. Do not lay masonry in freezing weather unless adequate means are used to prevent freezing.
- C. Any frozen masonry shall be removed and replaced.

3.06 CLEANING MASONRY WORK

- A. All exposed surfaces of concrete block walls shall be cleaned and left ready for painting. Surfaces shall be rubbed with carborundum stone to remove mortar fins and droppings, then the surface shall be washed with water and clean rinsed to removed dust and residue.
- B. Remove all excess water and residue from surrounding floor surfaces after cleaning is completed.

3.07 CLEAN UP

- A. All debris resulting from the masonry work shall be removed from the site at the completion of the masonry work.

END SECTION 04220

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section shall include the furnishing of all labor, material, and equipment as necessary to furnish and install all items of Cast Stone as shown on the drawings and as herein specified.

1.02 HANDLING & STORAGE

- A. Loading: All cast stone will be carefully packed and loaded using reasonable and customary precautions against damage in transit.
- B. Unloading: All cast stone shall be received and unloaded by competent workers at the project site. They will use necessary care when handling to avoid soiling or damage.
- C. Storage: All cast stone must be stored clear of the ground on nonstaining planking in a manner that protects it from damage. If stored for an extended period, the cast stone must be covered with polyethylene or other nonstaining waterproof material.

1.03 SUBMITTALS

- A. Prior to fabrication, delivery and application of materials to be installed under this section of the Specifications, the Contractor shall submit product cut sheets that identify the manufacturer, model number, dimensions, color and finish charts, material data, installation specifications and samples, as applicable, to the Architect in pdf format.
- B. Shop and setting drawings shall show stone sizes and details, joint arrangement, anchor details, reinforcing, etc.
- C. Contractor shall submit samples to the Architect for approval, indicating color and texture.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Cast Stone shall be as manufactured by Midwest Cast Stone, 1610 State Ave., Kansas City, Kansas 66102. (Local representative: Traver Supply, Mattoon, IL Phone: 217/235-5486; Fax: 217/235-5454).
- B. Equal products of other manufacturers will be considered if listed on the Material Sheet along with the Contractors Bid, and indicating whether the price is an addition to, or deduction from, the Base Bid specification.

2.02 CAST STONE MATERIALS

- A. Cast stone shall consist of the following materials:
 - 1. Cement: Portland Type I white and/or gray, meeting ASTM C150.

2. Fine Aggregate: Must be carefully graded and washed natural sands or limestone sands meeting ASTM C33. An exception is that gradation may vary to achieve desired texture and finish.
3. Coarse Aggregate: Must be crushed graded stone.
4. Compressive Strength: 5,000 psi minimum.
5. Coloring: All colors added must be inorganic (natural or synthetic) iron oxide pigments meeting ASTM C979. This excludes use of a cement grade of carbon black pigment, and will be guaranteed by the manufacturer to be light-fast and lime-proof. The amount of pigment will not exceed 10% by weight of cement used. Two (2) colors to be used on this project.
6. Reinforcement: Cast stone panels shall have a minimum thickness of 2½”, and shall be reinforced for handling and to allow temperature changes and structural stress.
7. Curing: After manufacturing, cast stone shall be cured for 24 hours in a totally enclosed curing room under a dense fog and water spray at 95% relative humidity.
8. Engraving: Cast stone panels shall be engraved with “V” - shaped profile. Letter style shall be Helvetica font at sizes indicated on the drawings.

2.03 ANCHORS

- A. All anchors, dowels and other anchoring devices shall be provided by the stone setter as shown on approved shop drawings. Whenever possible, commercially available standard building stone anchors will be used.
- B. All anchors shall be stainless steel.

PART 3 – EXECUTION

3.01 SETTING CAST STONE

- A. Techniques: All cast stone must be accurately set by experienced stone masons, according to shop and setting drawings.
- B. Mortar: When setting with mortar, all stones not already wet will be drenched with clear water just prior to setting.
- C. Joints: After setting each stone, all joints will be raked to a depth of ¾” from the face for pointing. Each stone face will then be sponged off to remove any mortar smears or splashes.
- D. Protection: All stone must be protected from splashed mortar or damage by other trades. Any foreign matter splashed on the stone must be immediately removed.

3.02 PATCHING

- A. Repair: Chipped or damaged cast stone must be repaired only by technicians skilled in this class of work. They must use materials provided by the manufacturer and follow the manufacturer's directions.
- B. Imperfections: Cast stone must show no obvious repairs or imperfections. This does not include minimal color variations when viewed with the unaided eye from 20 feet under good lighting.

3.03 POINTING & CLEANING

- A. Pointing: Before pointing, cast stone faces must be scrubbed with a fiber brush, using water and soap powder, then rinsing thoroughly with clean running water. Any mortar on the faces must be removed. No acids or prepared cleaners may be used without approval from the cast stone manufacturer.
- B. Pointing mortar shall be pressed into the joints to completely fill all joints, and tooled smooth with a long pointing tool.
- C. Pointing mortar shall be in color to be selected by the Architect. Mortar color shall be as manufactured by Solomon Grind-Chem, Inc., Springfield, Illinois or equal.

END SECTION 04720

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment and services as necessary to install Miscellaneous Metals as shown on the drawings and as specified herein.
- B. Miscellaneous metals included in this section are as follows:
 - 1. Guard Posts

1.02 SUBMITTALS

- A. Submit miscellaneous metals shop drawings and/or manufacturers literature in pdf format to the Architect for review prior to fabrication and shipment.

1.03 REFERENCES

- A. Reference standards:
 - 1. ASTM:
 - a. ASTM A653/A653M-94 “Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.”
 - b. ASTM A780-93a “Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.”

PART 2 – PRODUCTS

2.01 GUARD POSTS

- A. Furnish and install steel guard posts set in concrete at locations indicated on the drawings. Post shall be 6” steel pipe filled with concrete. Post shall be 8’-0” long and extend 3’-0” Below finished floor. Paint entire exposed area.

END SECTION 05500

PART 1 – GENERAL

1.02 SCOPE OF WORK

- A. The work required under this section shall include the furnishing of all labor, material, and equipment as necessary to furnish and install all items of Plastic Laminate Casework as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect along with a schedule of all accessories and color samples in pdf format.

1.03 RELATED WORK

- A. Provide all necessary nailers and blocking as required for proper anchorage and attachment of all casework.

PART 2 – PRODUCTS

2.01 CASEWORK MATERIALS

- A. Core Material: Particleboard core material shall be minimum 45 lb. density industrial grade.
- B. Surface Material: Exposed cabinet components, door and drawer fronts, interior surfaces and shelves shall be permanently covered:
 - 1. Exposed Exterior Surfaces shall be covered with vertical grade high pressure laminate.
 - a. Colors to be selected from laminate samples submitted by Casework supplier.
 - 2. Closed Interior Surfaces shall be covered with thermo-fused laminate in white or maple wood grain
 - a. Colors to be selected from laminate samples submitted by Casework supplier.
 - 3. Exposed Interior Surfaces shall be covered with vertical grade high pressure laminate to match door color.
 - a. Colors to be selected from laminate samples submitted by Casework supplier.
- C. Edgings: Exposed edges of cabinet members shall be edged with (.020) flat edge extrusion banding and door/drawer fronts shall be edged with 3mm extrusion banding
 - a. Colors to be selected from laminate samples submitted by Casework supplier.
- D. Hardware:
 - 1. Hinges shall be fully concealed when door is closed. Hinges shall be commercial grade 120 degree pivot overlay style. Hinges shall have spring loaded self- close.

DIVISION 6 – WOOD & PLASTICS
Section 06410 – Laminate Casework

2. Pulls shall be 8mm diameter x 128mm bent wire with powder coated or plated finishes from manufacturers standard offering.
 3. Door catches shall be heavy duty spring loaded roller type. Catch strike plate shall be injection molded nylon.
 4. Drawers shall be suspended on full extension 120# ball bearing slides.
 5. Shelving shall be adjustable and supported by adjustable shelf supports of injection molded clear polycarbonate with 5mm diameter double pin engagement and adjustable on 32 mm spacing. Color to be selected.
- E. Work Surfaces:
1. Plastic laminate countertops shall be surfaced with general purpose .040" thick plastic laminate. Countertop core shall be 1 1/8" thick 45 lb. density industrial grade particleboard. Exposed edges shall be covered with same laminate as top surface.
 2. Backsplashes shall be surfaced with same laminate as top.
 3. Countertops shall be square selfedge.
 4. All countertops to be installed with end splashes at wall returns. End splashes shall be surfaced with same laminate as top.
- F. Rubber Base: Flooring Contractor to supply & install rubber base molding for toe space of all cabinets.

PART 3 – EXECUTION

3.01 INSTALLATION OF CASEWORK

- A. Sinks and fittings in countertops.
1. Sinks and fittings in countertops shall be furnished by Plumbing Contractor.
 2. Sink shall be installed in countertop by Casework Contractor. All waste and water piping shall be furnished and installed by Plumbing Contractor.
- B. Furnish and install all fillers, scribes, finished ends, etc., as required for a complete and finished installation.
- C. All casework shall be securely anchored in place with appropriate type anchors.
- D. Where cabinets abut wall surfaces the joint shall be continuously sealed with an appropriate commercial grade sealant and tooled smooth.
- E. Casework Contractor shall be responsible for all job site measurements to assure that cabinets and counter top are accurately fit to the finished building construction.

END SECTION 06410

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07210 – Building Insulation

0PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, materials, equipment, and services necessary to complete all items of Insulation as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 INSULATION MATERIALS

- A. Unfaced Batt or Blanket Insulation:
Unfaced Batt or Blanket Insulation shall be friction fit type fiberglass conforming to ASTM C665, Type 1.
- B. Sill Sealer shall be 1" x 6" wide fiberglass insulation laid between top of foundation and sill plates.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Walls as indicated shall receive the following type of insulation batts:
 - 1. R-11 unfaced friction fit, full depth of 2 x 4 studs.
 - 2. Insulation shall be installed neatly in stud spaces, joist spaces, and other void spaces in wall framing to completely insulate the building perimeter walls. Insulation shall be installed between all window and door frames and adjacent wood framing to eliminate infiltration around frames. Contractor shall pay careful attention to locations where mechanical and electrical systems, devices, etc. intersect insulated walls to assure that this insulation barrier is not interrupted.
 - 3. Insulation shall be installed to fill all spaces around pipes, ducts, framing members, etc.
- B. Ceiling Insulation (Attic) shall receive the following:
 - 1. Two layers of R-19 unfaced batt or blanket insulation.
 - 2. First layer shall be installed between bottom chords of roof trusses.
 - 3. Second layer of insulation shall be installed on top of and perpendicular to first layer of insulation.
 - 4. Insulation shall be installed to fill all voids and provide a continuous layer of insulation.

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07210 – Building Insulation

5. All water piping and heating and cooling duct work installed in attic space shall be covered with 6” minimum thickness of insulation, without voids for air penetration.
- C. Sill sealer shall be 1" x 6" wide fiberglass insulation laid continuous between top of foundation and sill plates.
- D. Insulation Baffles:
Install insulation baffles as indicated on the drawings. Baffles shall be card-board, bead board, corrugated plastic, wood fiber tubes, or equal, installed to provide a minimum of 45 square inches of free area. Staple baffles to roof framing to hold in place. Baffle shall be of sufficient length to extend beyond plane of top of insulation by two inches minimum.

3.02 REPAIR OF DAMAGED MATERIALS

- A. Any insulation that has become damaged, displaced, or water soaked shall be removed and replaced with new insulation material.

END SECTION 07210

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07211 – Perimeter Insulation

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, and equipment as necessary to install all items of Perimeter Insulation as indicated on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of materials to be installed under this section of the Specifications, the Contractor shall submit product cut sheets that identify the manufacturer, model number, dimensions, material data and installation specifications, to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Perimeter Insulation shall be rigid insulating board consisting of an extruded polystyrene closed cell foam with a minimum compressive strength of 25 PSI. Insulation shall be permanently resistant to water and water vapor, and shall not deteriorate or crumble after installation.
- B. Insulation board shall be Dupont, Styrofoam Brand, Square Edge complying with ASTM C 578 - 19, Type IV. Insulation shall be 1 1/2" thick and in lengths and widths required to fit the construction where used. Lengths shall be as long as possible to eliminate joints.
- C. Insulation shall have a minimum "R" value of 5.0 per inch of thickness.
(5 year aged value @ 75° F).
- D. Adhesive shall be as recommended by the manufacturer of the insulation board.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Perimeter insulation shall be installed at the following locations:
 - 1. Install perimeter insulation below floor slabs, on interior side of exterior wall, as indicated on the drawings.
 - 2. Install perimeter insulation at perimeter of frost walls at exterior entrances, and below exterior slabs at entrances. See drawings.
 - 3. Install perimeter insulation at all exterior foundation walls in the crawl space.
 - 4. Perimeter insulation shall be of thickness indicated on the drawings and shall extend from the top of the footing to the bottom of the floor joist.

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07211 – Perimeter Insulation

- B. The insulation shall extend from directly under the slabs on grade to a minimum of 24" below finish grade.
- C. Install insulation boards in sizes as large as practical to eliminate joints.
- D. Insulation shall be held in place with adhesive as recommended by the insulation manufacturer.
- E. Any damaged insulation board shall be removed and replaced before proceeding with backfill.

END SECTION 07211

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07840 – Firestopping

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment and services as necessary to install Firestopping as shown on the drawings and as specified herein.
 - 1. Area Firestopping:
 - a. Walls: Install firestopping around all piping and duct penetrations through walls.

1.02 SUBMITTALS

- A. Prior to delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Firestopping materials shall consist of Thermafiber mineral fiber safing insulation and Thermafiber Firecode compound as manufactured by USG Corp., Chicago, Illinois, or equal.
- B. Installation shall comply with UL #WL-1027 for wall penetrations.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Equipment, mixing, and application shall be in accordance with the manufacturers written application instructions.
- B. All surfaces to receive fireproofing shall be free of all oils, scale, dirt, paints and primers or any other foreign material which would impair satisfactory bonding to the surface.
 - 1. Safing Insulation Application:
Clean substrate of dirt, dust, grease, oil, efflorescence, loose material or other matter. With a serrated knife, cut Thermafiber Safing Insulation slightly wider than the opening. Compress and tightly fit min. 2½” or 3” thickness (per system specifications) of insulation with min. density of 3.5 pcf completely around penetrant.
 - 2. Firestopping Compound Application:
Mix Firecode Compound according to directions on bag. Using a trowel, putty knife or spatula, scoop the compound from its container and work it into the penetration opening. Apply compound to min. ½” or 1” thickness (per system specifications) on top of safing insulation. Ensure that compound is in contact with all surfaces and that entire opening is filled with safing and compound.
- C. Firestopping materials shall be installed to achieve a one (1) hour minimum fire rating per UL design requirements.

END SECTION 07840

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07920 – Sealants & Caulking

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment, and services as necessary to complete all caulking work as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to installing caulking materials the Contractor shall submit product literature to the Architect in pdf format for review. Literature shall include specific information on all components, including manufacturers installation instructions and warranties.

1.03 GUARANTEE

- A. This Contractor shall guarantee all caulking work for a period of one (1) year from date of acceptance against any faulty workmanship of faulty materials, and shall make good any failure at his own expense. The following type of failures will be adjudged defective work: leakage, hardening, cracking, crumbling, melting, shrinking, or running of caulking compound, or staining of adjacent work by the caulking compound.

PART 2 – PRODUCTS

2.01 EXTERIOR CAULKING MATERIALS

- A. Caulking sealant shall be a "Dymeric" polyurethane as manufactured by Tremco Mfg. Co., Cleveland, Ohio or equal.
- B. Joint backing where required shall be a closed cell non-staining polyethylene in round or rectangular shape as appropriate. Tremco Joint Backing, or equal.
- C. Caulking shall match color of adjacent material where caulking is required. Colors to be selected by the Architect.

2.02 INTERIOR CAULKING MATERIALS

- A. Caulking sealant shall be a "Silicone II" as manufactured by GE Silicones Mfg. Co., Wilton, CT or equal.
- B. Joint backing where required shall be a closed cell non-staining polyethylene in round or rectangular shape as appropriate. Tremco Joint Backing, or equal.
- C. Caulking shall match color of adjacent material where caulking is required. Colors to be selected by the Architect.

DIVISION 7 – THERMAL & MOISTURE PROTECTION
Section 07920 – Sealants & Caulking

PART 3 – EXECUTION

3.01 PREPARATION

- A. Building joints shall be examined prior to application, and any conditions detrimental to achieving a positive weathertight seal shall be corrected by the General Contractor.
- B. All joints and openings to be sealed shall be thoroughly clean, dry, and free from dust, oil, grease, loose mortar, or any other foreign matter.
- C. Where joints are deeper than ½" polyethylene joint backing shall be packed into the joint to within ½" of the surface.
- D. Surfaces with protective coatings with which the sealant will come in contact, such as new aluminum, shall be wiped with a solvent to remove any oil deposit on the metal surface.
- E. Masonry joint surfaces shall be wire brushed and air blown clean before caulking.

3.02 APPLICATION

- A. Sealant shall be applied through a nozzle opening of such diameter so that the full bead of sealant is gunned into the joint and filling the joint completely. A superficial or skin bead will not be acceptable.
- B. All beads shall be tooled immediately after application to insure firm full contact with the inner faces of the joint. Excess material shall be struck off with a tooling stick or knife.
- C. Remove all excess materials and smears adjacent to the joint as work progresses.
- D. Caulk around all windows, doors, louvers, or other places where different materials joint and there would be infiltration of air or water.
- E. Caulk all expansion and/or control joints where indicated on the drawings.
- F. All materials shall be used in accordance with the manufacturer's printed instructions.
- G. All places where cabinet and countertop abut walls, the crack shall be sealed with silicone sealant. The bead shall be as small as practical and shall be tooled smooth.
- H. All plumbing fixtures shall be sealed with silicone sealant where fixture meets the walls & floors.
- I. All casework in conjunction with floor tile shall be sealed to floor with silicone sealant.

END SECTION 07920

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section shall include the furnishing of all labor, material, and equipment as necessary to install all items of Steel Doors and Frames as shown on the drawings and as specified herein.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.
- B. Shop drawings shall be submitted at the same time that Hardware shop drawings and schedules are submitted.

PART 2 – PRODUCTS

2.01 STEEL DOOR FRAMES

- A. All steel door frames shall be 16 gauge pressed steel constructed to details indicated for various openings, with all necessary anchors. All corners shall be welded and ground smooth. Provide a minimum of three (3) anchors per jamb. Jambs, in general, shall be rabbeted, and shall have anchors placed in masonry or fixed to studs as wall is built. Frames shall be anchored to floor at each side of opening. Take particular care to see that frames are kept in proper position and plumb.
- B. Frames shall be thoroughly cleaned and protected inside and outside against corrosion, factory primed-paint, and sound-deadened. Frames shall be bonderized and receive one shop coat of baked-on rust inhibitive primer, ready for finish painting in the field.
- C. Frames shall be reinforced for all hardware, and punched for a minimum of three (3) mutes per door. These rubber silencers shall be provided and installed by this Contractor. Mutes shall be constructed of gray rubber.
- D. All hollow metal frames shall be as manufactured by Curries, Ceco, Amweld, Steelcraft, or Richmond, or equal and shall be same manufacturer as steel doors.
- E. Label frames shall be furnished for all labeled fire doors. See drawings for location of fire doors and frames.

2.02 FLUSH STEEL DOORS

- A. Steel doors, of size and thickness noted on the door schedule shall be as manufactured by Curries, Ceco, Amweld, Steelcraft, or Richmond, or equal.
- B. Flush steel doors shall be 1³/₄" thick in sizes indicated on the door schedule. Doors shall be fabricated of two No. 18 gauge roller leveled prime quality cold rolled steel sheets bonded to a polystyrene core (Fire Doors shall have "UL" approved mineral board core). Doors shall have flush seamless face sheets with edges welded and ground smooth. Top and bottom channels shall be No. 16 gauge steel. Hinge reinforcement shall be No. 7 gauge steel minimum, drilled and tapped at the factory. All exterior doors shall be provided with flush top cap to shed water.

DIVISION 8 – DOORS & WINDOWS
Section 08110 – Steel Doors & Frames

- C. All doors shall be reinforced at corners of stiles and rails and for all hardware. Doors shall be mortised for template hinges and shall be reinforced for locks and hardware specified under Section 08700. See Hardware Schedule.
- D. Provide openings for view windows and louvers as indicated on the Door Schedule.
- E. All reinforcement and preparation for hardware shall be done from templates supplied by Finish Hardware Supplier.
- F. These doors shall be thoroughly cleaned, primed, and given one coat of baked-on rust inhibitive primer to receive finish painting in the field.
- G. Furnish and install "UL" Labeled Fire Doors with rating as indicated on the door schedule.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Steel door frames shall be installed plumb and square and securely braced during construction.
- B. Anchor steel frames to floor at each side of the opening, and install jamb anchors as required to securely anchor frames to wall construction.
- C. Install steel doors using hardware as specified under Section 08710 – FINISH HARDWARE.

END SECTION 08110

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment, and services as necessary to install the Upward Acting Doors as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of materials to be installed under this section of the Specifications, the Contractor shall submit product cut sheets that identify the manufacturer, model number, dimensions, color and finish charts, material data and installation specifications, to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 DOORS AND HARDWARE

- A. Upward acting doors shall be Aluminum Glass Door, Model 591, sectional steel door as manufactured by Overhead Door Corp., Dallas, Texas.
- B. Equal upward acting doors as manufactured by Haas Door Company, Ideal Door Company, and Raynor Doors will be acceptable.
- C. Doors shall contain the following features:
 - 1. Sections shall be nominal 2" thick, 20 gauge galvanized steel, with foamed in place polyurethane core, and E.P.D.M. rubber thermal break seals. "R" value = 17.4.
 - 2. Vision opening shall be double acrylic glazing with rubber sealing gasket.
 - 3. Finish shall be factory applied baked on polyester in color to be selected.
 - 4. Doors shall be fully weatherstripped, with bulb type E.P.D.M. rubber seal on bottom.
 - 5. Hinges and fixtures shall be galvanized. Rollers shall be ball-bearing with hardened steel races. Track shall be 2" standard, angle mounted. Standard counterbalance springs.
 - 6. Operation shall be by electric operator as specified below.
- D. Furnish and install framing, casing, trim, blocking, hangers, etc., for a complete operating installation.

2.02 ELECTRIC OPERATORS

- A. All upward acting door, **except doors at HCI #115 & NaClO₂ #116** shall be equipped with electric operator. Size, type, and horsepower of operators shall be according to the manufacturer's recommendations for each door being served.

DIVISION 8 – DOORS & WINDOWS

Section 08360 – Upward Acting Doors

- B. Each operator shall be furnished with one (1) three button “OPEN-CLOSE-STOP” control switch, complete with all necessary limit switches and controls for a complete operating installation. Exact location of switches shall be directed by the Owner.
- C. Provide two (2) remote control switches for each door installed.
- D. Doors at **HCI #115 & NaClO₂ #116** shall have keyed lock w/ slide locks

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Upward acting door installation shall be according to the manufacturer’s shop and installation drawing and instructions.
- B. Make all necessary adjustments to provide smooth and trouble free operation.
- C. Instruct the building owner in the proper maintenance and lubrication of the doors and operators.

END SECTION 08360

DIVISION 8 – DOORS & WINDOWS
Section 08410 – Aluminum Doors, Frames & Hardware

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, and equipment necessary to complete all items of Aluminum Doors, Frames and Hardware as shown on the drawings and as specified herein.

1.02 GENERAL REQUIREMENTS

- A. The Contractor shall be responsible for verifying all dimensions and measurements at the job site to assure the correctness of same. Provide all special sizes and shapes and all miscellaneous aluminum trim as necessary to present a complete and finished installation.
- B. All lumber and plywood used for blocking and shims shall be treated materials to prevent rot and termite damage.
- C. All screws, anchors, and fasteners shall be non-corrosive.
- D. Adjust all hardware at the conclusion of the project and leave in perfect operating condition. Clean all glass and aluminum surfaces as a last operation at the conclusion of the project.

1.03 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. For purposes of designating type and quality for work of this section, Drawings and Specifications are based upon products of Kawneer Company, Inc., a subsidiary of American Metal Climax, Inc., or equal.
- B. Equal products of other manufacturers will be considered if listed on the Material Sheet along with the Contractors Bid, and indicating whether the price is an addition to, or deduction from, the Base Bid specification.

2.02 ALUMINUM DOORS, FRAMES AND HARDWARE SCHEDULE

- A. EXTERIOR ENTRANCE DOOR – Break Area #102 to Exterior; Lab #105 to Exterior

- 1. DOOR: 3'-0" x 7'-0" Kawneer "350" Medium Stile Door with 3½" stiles and top rail, 8" bottom rail.
- 2. FRAMES: Kawneer "451T" 2" x 4½" Thermal-Break frames.
- 3. LOCKS: Hardware supplier (under Section 08710) to furnish keyed cylinder lock for installation by the aluminum door installer. Lock to work in conjunction with panic device

DIVISION 8 – DOORS & WINDOWS

Section 08410 – Aluminum Doors, Frames & Hardware

so that door is free from the inside when locked from the outside.

4. WEATHERSTRIPPING: Kawneer "Sealair Weathering System" at head, jambs, and bottom rail on doors.
5. PIVOTS: Top Intermediate and Bottom offset pivots..
6. CLOSERS: LCN #4040 XP surface mounted closer with adapter plates as required for out-swinging doors and delayed action feature. Finish to be selected.
7. PUSH/PULLS: Kawneer CO-12 offset pull with 1" diameter grip. Finish to be selected.
- NOTE: Exact location of Pull shall be as required to allow access to key way in lockset.
8. PANIC DEVICE: Kawneer 1786 Rim Exit Device, UL listed. Clear Anodized finish, with push bar finish to be selected. Provide cylinder lock and dogging, see above.
9. THRESHOLD: Kawneer aluminum threshold with mill finish, ½" maximum height.
10. STOPS & HOLDER: Kawneer floor mounted Stop and Drop Arm Holder.
11. FINISH: Doors, Frames, and all component parts finish to be selected. Standard Clear Anodized Finish.
12. GLAZING: Door, sidelites, & transoms shall be glazed with glass as specified under Section 08810 - GLASS & GLAZING.
- Glass shall be held in place with extruded glazing gaskets.
- Glass shall bear the manufacturer's label indicating type, and shall be visible after installation.
13. ALUMINUM TRIM: Provide 1/8" aluminum plate trim as detailed with Permanodic finish to match door. Attach aluminum plate with counter-sunk non-corrosive screws, to match finish on aluminum.
14. ERECTION: After erection and glazing, this Contractor shall check and re-adjust as required all items of operating hardware and leave installation in, perfect operating condition.

DIVISION 8 – DOORS & WINDOWS
Section 08410 – Aluminum Doors, Frames & Hardware

B. ALUMINUM FRAME WINDOWS

- | | |
|-------------------------|---|
| 1. FRAME: | Kawneer 451T 2” x 4½” Thermally broken frame |
| 2. SASH: | Provide sub-sill with end dams. |
| 3. FINISHES: | Finish to be selected. Standard Clear Anodized Finish. |
| 4. REINFORCED MULLIONS: | Shall be provided as required for local building code requirements. |

PART 3 – EXECUTION

3.01 INSTALLERS

- A. Installer shall be a company specializing in installation of aluminum doors, frames, hardware and glazing systems, with a minimum of 3 years experience.
- B. Installation shall be per the manufacturers product data, instructions, and shop drawings. All joints in framing and doors shall be sealed to prevent leakage.
- C. Repair or replace any damaged installed products. Clean installed products in accordance with manufacturers instructions.
- D. Make all necessary adjustments in operating hardware and leave installation in perfect operating condition.
- E. Remove all debris resulting from the installation and dispose of all debris.

END SECTION 08410

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, and equipment necessary to complete all items of Finish Hardware as shown on the drawings and as specified herein.
- B. All finishing hardware will be furnished and installed to meet the requirements of this building and will meet the requirements as follows:
 - 1. Quantities
 - 2. Templating
 - 3. Detailing
 - 4. Ordering
 - 5. Installation
 - 6. Keying
 - 7. Servicing

1.02 OMISSIONS

- A. The following items are to be omitted from this Contract:
 - 1. Case & Cabinet Hardware
 - 2. Sash Hardware

1.03 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. For the purpose of identification, the numbers listed have been taken from the catalogs of the following manufacturers:
 - 1. C. Hager & Sons
 - 2. Schlage Lock Co.
 - 3. Corbin Russwin Hardware Co.
 - 4. Reese Enterprises, Inc.
 - 5. Baldwin Corporation
 - 6. Knape & Vogt
 - 7. National Guard Products
- B. Equal products of other manufacturers will be considered.

2.02 HARDWARE MATERIALS

A. Butts:

1. Each leaf requiring butts must meet manufacturer's standards in size and gauge. Hager Co., Stanley or Lawrence, 4½ x 4½ size .134 gauge.
 - a. Exterior Doors – Satin Stainless Steel, 4 ball bearing
 - b. Interior doors with closers - Steel 2BB
 - c. Interior doors without closers - Steel Plain Bearing
2. All hinges shall have non-removable pins, with set screw for removal.

B. Locksets:

1. All locksets shall be the product of one manufacturer and function shall be as listed throughout.
 - A. Standards – Corbin - Russwin CLX3300 Series Heavy Duty Cylindrical.
 - B. Design – NZ Standard, Lever Handle.
 - C. Function
 - a. Passage – CLX 3310
 - b. Dummy – CLX 3350 (HALF) CLX 3370 (FULL)
 - c. Exit – CLX 3340NT
 - d. Privacy – CLX 3320
 - e. Office – CLX 3361
 - f. Corridor – CLX 3375
 - g. Communicating – CLX 3381
 - h. Class Room – CLX 3355
 - i. Storeroom – CLX 3357
 - j. Deadbolt
 1. Key/Key

C. Closers:

1. All closers shall be of the full rack and pinion type with cast iron cases and forged arms completely reversible with removable covers.
 - a. Standards – Corbin, DC3200 Series with adjustable spring power, backcheck, and delayed action valve.
2. Function as to hold-open shall be as listed throughout. Sizes shall be manufacturer's standards.

D. Panic Devices:

1. All panic devices shall be as manufactured by Corbin, as follows:
 - a. Standards – Corbin No. ED4000, crossbar with mortise latch.
 - b. Exterior Trim – N33 Newport.

DIVISION 8 – DOORS & WINDOWS
Section 08710 – Finish Hardware

E. Stops & Holders:

1. Stops and holders shall be the product of one manufacturer and shall be the type listed throughout. Baldwin or Ives. Provide anchoring screws as required for wall/floor surface to which bumpers will be attached.
 - a. Wall bumper - BR7006 / WS406- Convex
 - b. Wall bumper - BR7007 / WS407 - Concave
 - c. Floor bumper - BR7009 / FS436
 - d. Floor bumper - BR7008 / FS438
2. Provide screws and anchoring devices as required for each type wall/floor application.

F. Weatherstripping:

1. Weatherstripping shall be the product of one manufacturer and shall be the type listed throughout. Reese or Pemko.
 - a. #DS70C Head & Jambs 3070
 #S205A Threshold 3'-0"
 - #353 Rain Drip
 - b. #DS70C Head & Jamb 6070
 #S205A Threshold 6'-0"
 - #92C Astragal

G. Flush Bolts:

1. Flush bolts shall be the product of one manufacturer and shall be the type listed throughout. Baldwin or Ives.
 - a. #SB360 8" bolt, accepts padlock, mortise strike.

H. Finishes

1. BHMA 626, Satin Chrome Finish, except as noted.

I. Keying:

1. All locks shall be keyed differently and masterkeyed. Furnish the following keys:
 - 6 each - Masterkeys
 - 2 each - Change keys per lock

END SECTION 08710

DIVISION 8 – DOORS & WINDOWS
Section 08720 – Finish Hardware

FINISH HARDWARE SCHEDULE

GROUP A - (Aluminum Exterior Entrance Door)

1. Provide master keyed cylinder to Aluminum Door Manufacturer for factory installation.
 2. All other hardware to be furnished with aluminum entrance.
-

GROUP B – (Exterior Single)

- 1½ Pair Butts – Hager
- 1 Panic Device – Corbin Russwin (Entrance)
 - 1 Closer – Corbin Russwin (Hold-Open)
 - 1 Weatherstripping – Reese
-

GROUP C – (Interior Door)

- 1 ½ Pair Butts – Hager
- 1 Lockset – Corbin - Russwin (Office)
 - 1 Door Stop – Baldwin – floor mounted.
-

GROUP D – (Interior Door – Storage, Pair)

- 3 Pair Butts – Hager
 - 1 Lockset – Corbin - Russwin (Passage)
 - 1 Lockset – Corbin - Russwin (Dummy)
 - 1 Set Flush Bolts – Baldwin
 - 2 Closer – Corbin Russwin (Hold Open)
 - 2 Door Stop – Baldwin – wall/floor mounted
-

GROUP E – (Interior Door – Mechanical)

- 1½ Pair Butts – Hager
- 1 Lockset – Corbin - Russwin (Passage) Knurled Handle
 - 1 Closer – Corbin Russwin
 - 1 Door Stop – Baldwin – wall/floor mounted
-

GROUP F – (Interior Door – Restroom)

- 1½ Pair Butts – Hager
- 1 Lockset – Corbin - Russwin (Privacy)
 - 1 Closer - Corbin Russwin
 - 1 Door Stop – Baldwin – wall mounted
-

GROUP G – (Overhead Doors)

1. All hardware to be furnished by the manufacturer. See Section 08360.
-

DIVISION 8 – DOORS & WINDOWS
Section 08720 – Finish Hardware

GROUP H – (Exterior Door – Storage, Pair)

- 3 Pair Butts – Hager
- 1 Panic Device – Corbin Russwin (Entrance)
- 1 Lockset – Corbin - Russwin (Dummy)
- 1 Set Flush Bolts – Baldwin
- 2 Closer – Corbin Russwin
- 2 Door Stop – Baldwin – wall/floor mounted
- 2 Weatherstripping – Reese (Exterior Doors)

GROUP J – (Interior Door)

- 1½ Pair Butts – Hager
- 1 Panic Device – Corbin Russwin (Passage)
- 1 Closer - Corbin Russwin
- 1 Door Stop – Baldwin – floor mounted.

END SECTION 08720

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work included under this section of the specifications shall consist of furnishing all labor, material, and equipment necessary to complete all items of Glass and Glazing as indicated on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

1.03 GENERAL REQUIREMENTS

- A. All safety glass shall bear the manufacturers label indicating type, and shall be visible after installation.
- B. All glass shall be installed with linear waves horizontal to minimize distortion.
- C. Surfaces to be glazed shall be thoroughly clean and dry at time glazing is done. After glazing is completed and before final acceptance by the Owner all glass and aluminum surfaces shall be thoroughly cleaned.
- D. The Contractor shall protect all glass after installation and shall replace any damaged or broken glass before acceptance by the Owner.

PART 2 – PRODUCTS & INSTALLATION

2.01 MANUFACTURERS

- A. The following manufacturers will be acceptable:
 - 1. LOF Company, or equal
 - 2. PPG Industries, or equal

- B. Glass and glazing shall be as follows:

2.02 MATERIALS

- A. Aluminum Doors, Sidelites & Transoms:
 - 1. Exterior aluminum doors shall be glazed with 1" insulated clear tempered safety glass. Glass shall be held in place with neoprene gaskets and snap-in aluminum stops as furnished with the doors.
 - 2. Sidelites and transoms at exterior aluminum framed entrances shall be glazed with 1" thick insulating clear tempered safety glass. Glass shall be held in place with neoprene gaskets.
 - 3. Interior aluminum vestibule doors, sidelites, and transoms shall be glazed with 1/4" thick clear tempered safety glass.

DIVISION 8 – DOORS & WINDOWS
Section 08810 – Glass & Glazing

B. Aluminum Windows:

1. Exterior aluminum windows shall be glazed with one inch (1") thick insulating glass, consisting of LOF, or equal, 1/4" Grey Tint Glass on the exterior face, 1/2" air space, and 1/4" Energy Advantage LOW-E Glass on the interior face.

C. Steel Doors:

1. Steel doors with windows shall be glazed with 1/4" clear laminated safety glass, or 1/4" tempered glass. Glass shall be held in place with stops furnished with the doors.

D. Mirrors:

1. Mirrors shall be 1/4" polished plate glass with stainless steel frame, ground and polished smooth. Mirrors shall be mounted to wall with concealed wall hangers for theft resistant mounting. Mirrors shall be Catalog No. B-290, 18" w x 36" h., Mounting height shall be as indicated on the drawings. as manufactured by Bobrick Washroom Equipment, Inc., or equal. Mounting height shall be as indicated on the drawings.
2. Install mirror above each lavatory in the following locations:

- a. Toilet No. 103

END SECTION 08810

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment, and services as necessary to complete all items of Gypsum Wallboard as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

1.03 GENERAL REQUIREMENTS

- A. Prior to installing gypsum materials the building shall be fully enclosed and water-tight.
- B. The heating system shall be in operation or temporary heat shall be provided by this Contractor to maintain proper temperature condition in the building during all phases of the gypsum wallboard installation and finishing.
- C. All materials shall be installed according to the manufacturer's latest printed instructions.
- D. All materials shall be delivered to the job site in their original unopened packaging or containers and stored in an enclosed shelter providing protection from exposure to the elements or damage. Any damaged or deteriorated materials shall be removed from the premises.
- E. In cold weather during gypsum drywall application, temperatures within the building shall be maintained within the range of 55 to 70 degrees F. Adequate ventilation shall be provided to carry off excess moisture.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Gypsum wallboard materials shall be as manufactured by National Gypsum Company (Gold Bond). Material by U.S. Gypsum Co., and Georgia-Pacific will be acceptable.

2.02 MATERIALS

- A. Fire Rated Gypsum Wallboard:
Fire rated gypsum wallboard shall be 5/8" thick "Fireshield" (Type "X"), 4' sheets in lengths as required. See drawings and details for required locations.
- B. Moisture Resistant Board:
Moisture Resistant board shall be 5/8" water resistant core 4' x length as required. Install on all walls where indicated on the drawings.
- C. Fasteners:
Fasteners shall be 1 3/8" Type S bugle head screws for single layer wallboard and 1 5/8" Type S bugle head screws for top layer of double layer wallboard.

- D. Joint Treatment Materials:
Joint treatment materials shall consist of pre-fill joint compound, perforated joint tape, and all purpose joint compound.
- E. Miscellaneous:
Provide all necessary trim, corner beads, control joints, anchors, etc., as required for a complete installation.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Preparation:
Examine all surfaces and supports to which gypsum wallboard is to be applied, and remedy all conditions which would jeopardize satisfactory finishes. All framing members shall be properly aligned to prevent uneven wall surfaces, and all necessary blocking shall be in place to assure proper anchorage of the wall board and other accessories such as handrails, grab bars, cabinets, shelves, plumbing fixtures, etc.
- All concealed mechanical and electrical work shall be in place before commencing drywall work.
- Special consideration shall be given to walls that will be washed by up or down lighting so that joints will not be emphasized by lights.
- B. Stockpiling Material:
The drywall subcontractor shall exercise caution when stockpiling materials within the structure to prevent loading floor surfaces beyond the safe load limit. Wallboard shall be protected at all times against getting wet. Any wet material shall be discarded.
- C. Wallboard Application:
Wallboard shall be applied with as few joints as possible with the long dimension of the board perpendicular to joist and studs. End joints shall be staggered, and located as far as possible from the center of joist spans. Wallboard joints shall be butted loosely, and shall have a maximum gap at butted end joints of ¼".
- Install sound attenuation sealant at perimeters of all sound-deadened partitions, and at all openings in walls to prevent sound transmission thru wall.
- Install metal corner trim at all outside corners according to manufacturer's installation instructions.
- D. Fastening:
Use Type S bugle head screws spaced 12" o.c. for sidewall and 12" o.c. for ceilings. Verify current spacing recommendations with manufacturer.
- E. Openings:
Openings cut in wallboard to fit around electrical outlets, piping, etc. shall be accurately cut to fit snug and small enough to be covered by finish wall plates and escutcheons.
- F. Joint Treatment:
Apply taping or embedding compound in a thin uniform layer to all joints and angles to be reinforced. Immediately apply tape centered over joint and seated into compound. Follow immediately with a thin coat to embed tape. The tape or embedding coat must be thoroughly dry before application of second coat.

DIVISION 9 – FINISHES
Section 09250 – Gypsum Wallboard

Apply second coat of joint compound over embedding coat, filling flush with surface; cover tape and feather out beyond tape. Allow second coat to dry thoroughly before applying finish coat.

Spread finish coat evenly over and extend slightly beyond second coat and feather to a smooth uniform finish. Where necessary, sand between coats to provide a smooth surface.

Apply an all purpose type compound to nail head depressions as the first coat. Follow with two additional coats of all purpose compound, leaving all depressions level with the surrounding surface.

Beads and trim shall be finished similar to joints, except omitting tape.

All joints above suspended acoustical ceilings shall be taped, further finishing will not be required.

G. Finishes:

All gypsum wallboard surfaces shall be left smooth and uniform, and ready to receive painting and decoration. Sand surfaces as necessary to achieve the desired finish.

3.02 **CLEAN UP**

- A. After completion of the gypsum wallboard work, all debris resulting from this work shall be removed from the building and site, and all surfaces cleaned of spills and splatters resulting from the work.

END SECTION 09250

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The Subcontractor for tile work is to be responsible for an acceptable complete installation, and is to furnish all labor, material, and service required for the areas to be tiled, and conforming in every respect to the type of tile, dimensions, colors, grades, patterns, and necessary trim shapes, as indicated.

1.02 SUBMITTALS

- A. Prior to installation the Contractor shall submit five (5) copies of manufacturers product literature and installation instructions to the Architect for review.
- B. Furnish samples of tile colors, sizes and shapes to the Architect for selection.

PART 2 – PRODUCTS

2.01 TILE MATERIALS

- A. All tile shall be standard grade Ceramic Mosaics conforming to TCA 137.1-1976 as manufactured by American Olean Tile Co., United States Ceramic Tile Co., or Florida Tile.
- B. Tile shall be of sizes indicated. Colors to be selected by Architect from current samples. The Contractor shall assume that a pattern of up to three colors may be used.
- C. Base shall be coved and bull nosed shapes shall be used where tile terminates.
- D. Adhesive shall be of type as recommended by the tile manufacturer for thin set method of applying tile.
- E. Grout shall be a standard waterproof grout approved by the tile manufacturer. Color of grout will be selected by the Architect.
- F. The Contractor shall furnish to the Owner all remaining full tile at the end of the project.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. All ceramic tile materials shall be delivered to the job in the original unopened shipping containers and stored in a suitable storage area.
- B. It shall be the General Contractors responsibility to provide an acceptable surface for installing the tile work. Installation of tile shall not start until all defects have been corrected, and when tile work starts it shall be considered as acceptance of the surface by the Tile Contractor.
- C. Tile shall be applied using the thin bed setting method and shall comply with the requirements of the Tile Handbook, "Thin Setting Bed Methods and Materials" as compiled by Don Graf.

DIVISION 9 – FINISHES
Section 09310 – Ceramic Tile

- D. Adhesives shall be spread uniformly with a notched trowel with ample material being applied to firmly seat the tile. Joints shall be straight and true, with tile neatly cut around openings or other obstructions.
- E. Waterproof grout shall be applied in sufficient quantity and with sufficient pressure to completely fill all joints, and wiped down to the base of the cushion of the tile and completely removed from the exposed surface of the tile.
- F. All corners shall be raked after grouting and caulked with silicone sealant to match grout color.
- G. After completion of the ceramic tile work, all debris resulting from this work shall be removed from the building and site, and all surfaces cleaned of spills and splatters resulting from the tile work.

END SECTION 09310

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work included under this section of the specifications shall include the furnishing of all labor, material, and equipment necessary to complete all items of Acoustical Ceilings as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.
- B. Submit samples of ceiling panels and suspension system to the Architect.

1.03 GENERAL REQUIREMENTS

- A. Acoustical materials shall be installed under temperature and humidity conditions closely approximating those which will exist when the building is occupied. They should not be installed when building is damp and cold or dry and hot.
- B. All wet work, including drywall, taping, concrete, etc., shall be completed and allowed to dry before the installation of acoustical tiles.
- C. All windows and doors shall be in place and glazed.
- D. The heating system shall be installed and operating to maintain proper conditions before, during, and after the acoustical work is in progress. All air filters shall be in place.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Acoustical ceiling materials shall be as manufactured by Armstrong Industries, Inc., or equal, and shall be installed in strict compliance with the manufacturer's current specifications.
- B. Equal acoustical ceilings as manufactured by Celotex Co., and USG Interiors will be acceptable.

2.02 MATERIALS

- A. Suspended acoustical ceiling systems shall include inverted tees, hanger wire, channel wall trim, acoustical ceiling panels, trim, anchors, etc, for a completely installed and finished installation.
- B. Suspended ceiling materials and installation shall assure a minimum of Class A Flame Spread classification as listed by Underwriters Laboratories.
- C. Materials shall be as follows:
 - 1. Suspension system shall be exposed grid galvanized steel inverted "T", 1½" main tees and 1 3/8" intermediate tees, 15/16" exposed face, with satin white enamel on exposed surfaces. Provide matching molding at walls and other vertical surfaces.

DIVISION 9 – FINISHES
Section 09510 – Acoustical Ceilings

2. In all areas where indicated on the drawings install Armstrong Fine Fissured HIGH NRC Angled Tegular No. 1756 square lay-in ceiling panels, 24" x 24" x 7/8". Tile shall be Class A fire rated, sag resistant and anti-microbial.

D. The Contractor shall furnish to the Owner 1 box of extra ceiling tile before final acceptance.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The Ceiling Contractor shall lay out tile as indicated on reflected ceiling plans and assist the Electrical Contractor in location of light fixtures so that they will be symmetrical with the tile. Refer to electrical drawings for lighting layout. System shall also be symmetrical, as near as possible, with openings in ceiling such as heating and ventilation grilles, and sprinkler heads.
- B. Hanger wires shall be of size, type, and spacing to properly support the acoustical ceiling, and as recommended by the manufacturer. Install additional hanger wires at light fixtures and any other ceiling supported equipment as necessary for proper support of the ceiling system.
- C. The ceiling contractor shall provide anchorage as required to attach the hanger wires to the structural framing members. Hanger wires shall be straight and without kinks, twists, or bends.
- D. Provide and install a metal wall molding at all places where ceiling stops at walls and other vertical surfaces.

END SECTION 09510

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment, and services as necessary to complete all items of painting as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.
- B. Color schedule will be furnished to the Painting Contractor by the Architect, showing the desired colors.

1.03 GENERAL REQUIREMENTS

- A. The following specifications cover the complete painting and finishing of all exposed wood trim, doors, masonry block, gypsum wallboard, unfinished metal, and other surfaces of the building as set forth in the Finish Schedule or in these specifications. Any items not specifically mentioned shall be finished as directed.
- B. The Painting Contractor shall supply all labor, materials, tools, ladders, scaffolding, and other equipment necessary for the completion of this work.
- C. The Painting Contractor shall examine the specifications for the various other trades and shall thoroughly familiarize himself with all their provisions regarding their painting. All surfaces that are left unfinished by the requirements of other specifications shall be painted or finished as a part of this Contract.
- D. The Painting Contractor shall be responsible for inspecting the work of others prior to the application of any paint or finishing material. If any surface to be finished cannot be put in proper condition or finished by customary cleaning, sanding, and puttying operations, the Painting Contractor shall immediately notify the Architect, in writing, or assume responsibility for and rectify any unsatisfactory finish resulting.

1.04 WORKMANSHIP

- A. Paint materials shall be applied by brush, roller, or airless spray only. No other method of application will be accepted.
- B. The workmanship shall be of the very best; all materials evenly spread and flowed on without runs or sags. Only skilled mechanics shall be employed.
- C. All surfaces to be painted shall be dry and cleaned of all loose dirt and dust before painting is started.
- D. All coats shall be thoroughly dry before applying succeeding coats. Tint each coat sufficiently so as to distinguish layer difference.
- E. Tops, bottoms, and edges of all doors shall be finished same as the balance of the doors after they are fitted by the Carpenter.

- F. The Painting Contractor shall not only protect his work at all times but shall also protect all adjacent work and materials by suitable coverage or other method during the progress of his work.
- G. Upon completion of the work remove all paint and varnish spots from the floors, glass, and other surfaces.
- H. Remove from the premises all rubbish and accumulated materials not caused by other trades and leave the work in a clean and acceptable condition.

1.05 SHOP & PRIME COAT BY FABRICATORS

- A. All structural steel, metal door frames, hollow metal doors and miscellaneous items of steel and iron shall receive one shop coat of nonasphaltic rust inhibitive paint by the fabricator (see specific sections).

PART 2 – PRODUCTS

2.01 MATERIALS

- A. The types of paints, varnishes, enamels, and similar materials shall be Pratt & Lambert, or equal.
- B. Only materials of the best quality of their respective kinds shall be used.
- C. All materials shall be delivered to the site in the original containers with seals unbroken and labels intact.
- D. All materials shall be used only as specified by the manufacturer's directions as labeled on the containers.

PART 3 – EXECUTION

3.01 EXTERIOR PAINTING SHALL BE AS FOLLOWS:

- A. Exterior steel doors, frames and items of exposed steel, shall receive the following:
(P & L Spec. #41.1)
 - 1. Sand surfaces and clean with solvent.
 - 2. Primer: One coat Rust Inhibiting Primer.
 - 3. Finish: Two coats Effecto Semi-Gloss Enamel.
- B. Exterior Block Walls:
 - 1. Exposed exterior block walls, new and existing, shall receive the following:
 - 2. Preparation: Surfaces shall be cleaned with “Sure Clean” Heavy Duty Cleaner as manufactured by ProSoCo, In., or equal. Rinse surfaces with high pressure water.
 - 3. Waterproof Coating: After surface has been cleaned and allowed to dry apply one coat of “Thorocoat” Waterproofing as manufactured by Thoro Company, or equal. Coating shall be mixed and applied per the manufacturer’s instructions. Color and texture to be selected.

3.02 INTERIOR PAINTING SHALL BE AS FOLLOWS:

DIVISION 9 – FINISHES
Section 09910 – Painting

- A. Masonry block walls indicated to receive Enamel Wall Paint shall receive the following: (P & L Spec. #118.4a)
 - 1. Primer: One coat Pro-Hide Block Filler.
 - 2. Finish: Two coats Pro-Hide Plus Latex Satin Enamel.
- B. Gypsum board walls indicated to receive Enamel Wall Paint shall receive the following: (P & L Spec. #114.5a)
 - 1. Primer & Finish: Two coats Pro-Hide Latex Satin Enamel.
- C. Interior steel doors, steel railings, steel door frames, steel ladders, and miscellaneous unfinished metals shall receive the following: (P & L Spec. #125.2a)
 - 1. Primer: One coat Interior Trim Primer.
 - 2. Finish: Two coats Pro-Hide Plus Latex Satin Enamel.
- D. New concrete floors and existing concrete floors indicated to be sealed, shall receive the following:
 - 1. Apply one coat of Hillyard Co. “Cem-Seal” or equal within 24 hours after final
 - 2. After floor surfaces are clean and dry apply one coat of Hillyard Co. “Seal 341” or equal.
- E. Exposed steel in Treatment Plant #110 including but not limited to, Pre-Engineered Metal Building framing, steel beams, joists, and metal deck shall receive the following: (P & L Spec. #128.2)
 - 1. Clean surfaces and touch up with rust inhibitive paint.
 - 2. One coat of Pro-Hide Plus Dry Fall-Out Spray Coating Satin.
(Apply at film thickness necessary to achieve hiding and uniform luster).

3.03 ITEMS NOT REQUIRING JOB PAINTING

- A. The following items are factory finished or otherwise finished by others and will not require painting on the job under this specification.
 - 1. Pre-finished exterior metal surfaces.
 - 2. Exterior insulation & finish system (EIFS).
 - 3. Aluminum doors, frames and windows.
 - 4. Pre-finished interior metal surfaces.
 - 5. Pre-finished casework.
 - 6. Toilet accessories.
 - 8. Water treatment plant equipment and piping.

END SECTION 09910

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment and services necessary to provide all items of Signage as shown on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Room Signage:

1. Furnish and install room signs as listed below to comply with Americans with Disabilities Act requirements. Signs shall be Type "MP" plastic signs with raised letters, Braille markings, and symbols as manufactured by Best Sign Systems, Montrose, Colorado, or equal.
2. Room signs shall be 1/8" thick, 2" high x 12" min. length, 3/4" lettering, with 1/32" raised letters, Braille markings, symbols, and border. Colors shall be selected from manufacturers color chips, with white letters on colored background.
3. Signs shall be mounted on wall adjacent to door openings, and shall be 60 inches above finish floor. Mount signs to wall with adhesive.
4. All lettered signs shall be provided with corresponding Braille markings.
5. Furnish the following room signs:
 - 1 Sign - RESTROOM, No. WP268ARB, 6" x 7³/₄" with handicap, & male & female symbols.
 - 1 Sign – Lockers & Shower
 - 2 Sign – Lab
 - 1 Sign – Mechanical Room
 - 1 Sign – Electrical Closet
 - 1 Sign – Treatment Plant
Employees Only

PART 3 – EXECUTION

3.01 INSTALLATION

- A. All materials shall be installed according to the manufacturer's instructions and shop drawings.
- B. Anchoring screws, adhesives, bolts, etc. shall be appropriate type to securely anchor to construction occurring at point of attachment. Anchoring devices shall be non-corrosive.

END SECTION 10440

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, and equipment necessary to complete all items of Steel Lockers as indicated on the drawings and as specified herein.

1.02 SUBMITTALS

- A. Prior to installation the Contractor shall submit five (5) copies of manufacturers product literature and installation instructions to the Architect for review.
- B. Furnish color charts for color selection by the Architect.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Lockers shall be as manufactured by Republic Storage Products, Montgomery Il. (Phone: 800/477-1255).
- B. Equal lockers as manufactured by DeBourgh Co., American Locker Systems, and List Industries, Inc., will be acceptable.

2.02 MATERIAL & CONSTRUCTION - Locker Room Lockers

- A. All lockers shall be “Heavy Duty Ventilated Lockers”, 12” wide, 12” deep, and 60” high. Lockers shall be a combination of 2 tier and 5 tier, with number and layout as indicated on the drawings. Lockers shall be constructed of prime cold rolled steel as follows:
 - 1. Door Frames:
Frames shall be 16 gauge steel formed into 1” deep face channel shapes with continuous vertical door strike integral with the frame on both sides of the door opening. 16 gauge cross frame members shall be welded to vertical frame members to ensure a square and rigid assembly.
 - 2. Doors:
Double tier door shall be formed from one piece 14 gauge steel, with full channel shape on the lock side and hinge side, and angle formations across top and bottom of doors.
Doors shall be perforated for ventilation with diamond shaped perforations, leaving sufficient metal for strength.

3. Handles, Latching & Locks:

- a. Handles shall be contained in a 20 gauge stainless steel recessed pocket, with mounting area for pad lock and mounting for the number plate.
- b. Each door shall be provided with a factory installed, welded on spring latching device. Latching shall be automatic when the door is shut by means of a torsion spring loaded trigger which engages a welded-on frame hook.
- c. Each locker shall be provided with built-in Master Combination Lock with master key.

4. Locker Body:

Locker backs shall be formed from 18 gauge steel with right angle flange on each side for stiffness. Tops, bottoms, shelves and compartment dividers shall be formed from 16 gauge steel flanged on all sides for stiffness. Shelves shall have channel shaped front edge.

All locker body parts shall be finished in same color as selected for doors and frames.

5. Finish:

All locker parts shall be cleaned after fabrication with a solution to inhibit corrosion, and finished with baked on enamel to provide a tough and durable finish. Colors shall be selected from manufacturers color charts.

6. Interior Equipment:

Each double tier locker shall be equipped with one double prong back hook, and two single prong wall hooks in each compartment. Five tier lockers shall be furnished without hooks.

PART 3 – EXECUTION

3.01 ASSEMBLY & INSTALLATION

- A. All materials shall be installed according to the manufacturer's instructions and shop drawings.
- B. Lockers shall be assembled with corrosion resistant fasteners which resist loosening, and shall be the manufacturers standard for each type of locker furnished.
- C. Lockers shall be securely attached to each other, and securely anchored in place to the wall and base. All anchoring screws, bolts and devices shall be non-corrosive.

END SECTION 10500

Part 1: General

- 1.1 Description of Work
 - A. Work in this section includes furnishing and installation of extruded aluminum overhead hanger rod style canopies as manufactured by Mapes Industries Inc.
 - B. Related Items and Considerations
 - 1. Flashing of various designs may be required. Supplied by the installer.
 - 2. Determine wall construction, make-up and thickness.
 - 3. Ensure adequate wall condition to carry canopy loads where required.
 - 4. Consider water drainage away from canopy where necessary.
 - 5. Any necessary removal or relocation of existing structures, obstructions or materials.
- 1.2 Quality Assurance
 - A. Products meeting these specifications established standard of quality required as manufactured by Mapes Industries, Inc. Lincoln, Nebraska 1-888-273-1132.
- 1.3 Field Measurement
 - A. Confirm dimensions prior to preparation of shop drawings when possible.
 - B. If requested, supply manufacturer’s standard literature and specifications for canopies.
 - C. Submit shop drawings showing structural component locations/positions, material dimensions and details of construction and assembly.
- 1.4 Performance Requirements
 - A. Canopy must conform to local building codes.
 - B. Determine if specific load requirements have been established for canopies and if stamped calculations are required for location in which canopy is installed.
 - C. The canopy must handle a minimum of 30 PSF live load.
- 1.5 Deliver, Storage, Handling
 - A. Deliver and store all canopy components in protected areas.

Part 2: Products

- 2.1 Manufacturer
 - A. Mapes Canopies Lincoln, or Equal.
Lincoln Nebraska 68514
Phone: 1-888-273-1132.

- 2.2 Materials
 - A. Decking to be 3” extruded flat soffit .078 decking
 - B. Fascia shall be standard 8” extruded “J” style (minimum .125 aluminum)
 - C. Hanger rods and attachment hardware shall be powder coated to match canopy.
 - D. Decking and fascia shall be extruded aluminum, alloy 6063-T6, in profile and thickness shown in current Mapes brochures.

- 2.3 Finishes
 - A. Standard finishes are clear anodized, bronze or white baked enamel.

- 2.4 Fabrication
 - A. All connections shall be mechanically assembled utilizing 3/16” fasteners with a minimum shear stress of 350 lb. Pre-welded or factory-welded connections are not acceptable.
 - B. Decking shall be designed with interlocking extruded aluminum members with mechanical fasteners field applied to provide structural integrity for the completed assembly.
 - C. Concealed drainage. Water shall drain from covered surfaces into integral fascia gutter and directed to either the front for front drainage or to the rear for ground level discharge via one or more designated downspouts.

Part 3: Execution

- 3.1 Inspection
 - A. Confirm that surrounding area is ready for the canopy installation.
 - B. Installer shall confirm dimensions and elevations to be as shown on drawings provided by Mapes Industries.
 - C. Erection shall be performed by an approved installer and scheduled after all concrete, masonry and roofing in the area is completed
- 3.2 Installation
 - A. Installation shall be in strict accordance with manufacturer’s shop drawings. Particular attention should be given to protecting the finish during handling and erection.
- 3.3 After installation, entire system shall be left in a clean condition.

END SECTION 10810

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section shall include the furnishing of all labor, material, and equipment necessary to complete all items of Toilet Accessories as indicated on the drawings and as specified herein.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Toilet accessories shall be products of Bobrick Washroom Equipment, Inc., North Hollywood, California, or equal.

2.02 MATERIALS

A. Grab Bars:

1. Grab bars shall be 1½" diameter, 18 gauge, Type 304 satin finish stainless steel, with peened non-slip gripping surfaces, Series B-6806.99 with exposed mounting, as manufactured by Bobrick, Inc., or equal. Grab bars shall be installed with stainless steel vandal resistant screws.
2. Grab bars shall be installed in the following areas:
 - a. Toilet #103 Install one No. B-6806 x 42", one No. B-6806-36" and one No. B-6806 x 18".
 - b. Lockers #104 Install two No. B-6806 x 30" and one No. B-6806-48"
3. Grab bars at water closets shall be mounted at locations as shown on the drawings. Install solid blocking in walls to securely anchor grab bars.

B. Toilet Tissue Dispensers:

1. Toilet tissue dispensers shall be ABS plastic, surface mounted. Tissue dispensers shall be as manufactured by Bobrick, Inc., or equal, and of the following types and locations:
 - a. Toilet #103 Install Catalog No. B-4288 contura series surface mounted multi-roll surface mounted toilet tissue dispenser.
2. Refer to the drawings for locations of tissue dispensers and install per the manufacturers installation instructions.

DIVISION 10 – SPECIALTIES
Section 10810 – Toilet Accessories

C. Paper Towel Dispensers:

1. Paper towel dispensers shall be ABS plastic surface mounted. Towel dispensers shall be as manufactured by Bobrick, Inc., or equal, and of the following types and locations:
 - a. Toilet #103; Break Area #102 & Lab #105
Install Catalogue No. B-4262 contura series surface mounted paper towel dispenser.
2. Refer to the drawings for locations of towel dispensers and install per the manufacturers installation instructions.

D. Soap Dispensers:

1. Soap dispensers shall be type 304 stainless steel with satin finish on exposed surfaces, with tumbler locks (all keyed alike) on soap vessels, and corrosion resistant liquid soap dispensers. Soap dispensers shall be as manufactured by Bobrick, Inc., or equal, and of the following types:
 - a. Toilet #103; Break Area #102 & Lab #105
Install No. B-4112 contura series surface mounted dispenser at each lavatory.

E. Mirrors:

1. See Section 08810 - GLASS & GLAZING

END SECTION 10810

DIVISION 13 – SPECIAL CONSTRUCTION
Section 13120 – Pre-Engineered Metal Building System

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The work required under this section includes the furnishing of all labor, material, equipment, and services necessary to complete all items of the Pre-Engineered Metal Building as indicated on the drawings and as herein specified.

1.02 SUBMITTALS

- A. Prior to fabrication, delivery and application of any materials, the Contractor shall submit manufacturer's current literature and installation specification covering all materials to be installed under this section of the Specifications to the Architect in pdf format. Shop Drawings shall bear the stamp of the Registered Structural Engineer certifying the Complete Building Design.
- B. Furnish shop drawings and anchor bolt setting drawings.
- C. Erection drawings and instructions adequate to erect the building shall be supplied by the manufacturer. Erection drawings shall consist of plans, elevations, cross sections, and details necessary to erect and finish the building. The erector shall be responsible for any deviation from the manufacturer's erection drawings.
- D. Drawings shall be clear and complete to the satisfaction of the Architect.

1.03 DEFINITIONS

- A. Primary Framing. Consists of steel roof trusses, steel columns and beams, and end wall beams and columns.
- B. Secondary Framing. Consists of eave struts, roof purlins, wall girts, wind struts, base girts, and other miscellaneous framing.
- C. Roof Covering and Wall Covering. Consists of pre-finished steel panels, fasteners, mastic and all necessary trim.
- D. Basic Design Loads. Consists of dead loads, live loads, wind loads, and auxiliary loads.
- E. Auxiliary Loads. Consists of all loads, other than basic design loads, which the building must safely withstand such as roof top units, suspended mechanical equipment, ceilings, etc.
- F. Bay Spacing. Shall be measured from center to center of primary columns and trusses.
- G. Accessories. Consists of trim, flashing, closures, sealants, etc.

1.04 PRIMARY FRAMING

- A. Primary framing shall be designed for the specified loading conditions and shall consist of:
 - (1) clear span steel roof trusses, and beam and column framing.
 - (2) rigid frames constructed from rolled beams or continuous automatically welded plate-flat section.
- B. See plans for location of framing system.

DIVISION 13 – SPECIAL CONSTRUCTION
Section 13120 – Pre-Engineered Metal Building System

- C. End wall framing shall consist of steel truss supported on columns for future expansion.

1.05 SECONDARY FRAMING

- A. Purlins and girts shall be designed for the specified loading conditions and shall be fabricated from U.S. Standard Gauge Steel, and shall be "z" shaped.
- B. Wind bracing shall be designed and installed to be compatible with the various elements of the structure, and shall not interfere with windows, doors, etc.
- C. Flange bracing shall be steel angles or plates attached to purlins and/or girts, and primary framing. The quantity and locations shall be as directed by design and noted on the manufacturer's fabrication drawings.
- D. Bracing shall be provided between columns and in plane of roof as indicated on the drawings and as required by the manufacturer.

1.06 STRUCTURAL STEEL DESIGN

- A. All frames shall be designed either elastically or plastically using methods of analysis approved by AISC. All welded plate or cold formed structural members shall be designed in accordance with AISC and AISI specifications respectively.
- B. All structural plate or bar stock shall have a minimum yield strength of 36,000 PSI. All structural pipe shall conform to ASTM A-252 having a minimum yield of 35,000 PSI.
- C. All cold formed structural material shall have a minimum yield strength of 50,000 PSI.
- D. All rods and angles shall have a minimum yield of 36,000 PSI, except the angle stock used in open web framing, which shall have a minimum yield of 50,000 PSI.
- E. Structural bolts and nuts used with primary framing shall be high strength ASTM A-325 or SAE Grade No. 5. Bolts used with secondary framing shall conform to ASTM A-307.

1.07 DESIGN CRITERIA

- A. The primary and secondary framing and covering shall comply, where applicable, with the loads and combinations of these loads as set forth in these specifications, and the MBMA "RECOMMENDED DESIGN PRACTICES MANUAL."
- B. The basic design criteria, rationally applied to the structure and its components specified herein shall conform to the applicable form of the following accepted and approved design specification:
- C. American Institute of Steel Construction - "MANUAL OF STEEL CONST."
- D. American Iron and Steel Institute - "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STRUCTURAL MEMBERS."
- E. American Welding Society - "CODE FOR ARC AND GAS WELDING."
- F. Metal Building Manufacturers Association - "RECOMMENDED DESIGN PRACTICES MANUAL."

DIVISION 13 – SPECIAL CONSTRUCTION
Section 13120 – Pre-Engineered Metal Building System

1.08 DESIGN LOADS

- A. The basic design loads shall be as indicated on the structural plans by others.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. The Pre-Engineered Metal Building indicated on the drawings and specified herein shall be as manufactured by Varco Pruden, Inc., American Buildings Company, Mesco Building Solutions, Chief buildings, A&S, Nucor Building Systems, Pinnacle Structures, Rediset Building Systems, or equal, provided the structure is of the same general design and does not constitute major revisions in the overall project. Any dimensional changes shall be the direct responsibility of the General Contractor, and any revisions required to accommodate a particular building manufacturer shall be submitted to the Architect for approval prior to construction.

2.02 ROOF PANELS

- A. Roof panels shall be 24 gauge SSR standing seam panels with minimum 3" high rib and 24" minimum coverage. Panels shall be mechanically seamed such that the final seam shall be a full 360 degree interlocking seam. The seamed clips shall allow for + or - 1 in. of thermal movement (2 in. slot). Clips shall be supplied with center dimple so that the tab will be centered in the slot during the seaming operation. Panels shall be furnished full length to avoid end laps. Panels shall be 50 KSI minimum yield steel.
- B. Roof panels shall be galvanized per ASTM A525, Class G90.
- C. Panel color shall be selected from manufacturers full range of available colors, with a minimum of eight (8) colors. Finish shall meet the following minimum standards:
1. Panels shall have a high performance oven baked acrylic primer on both surfaces.
 2. Exposed panel surface shall have a KXL Kynar based finish oven baked over the primer for a total dry film thickness of not less than 1 mil.
 3. Panels shall also have an oven baked silicon polyester backer coating for a total dry film thickness of not less than 0.5 mil. Color shall be White-Gray.
 4. Finish shall be warranted for 20 years against chalking, fading, blistering, peeling, or cracking, when exposed to normal atmospheric conditions.
- D. The roof panel system will have a Class 60 wind uplift rating as tested and approved by Underwriters Laboratories, Inc.

2.03 WALL PANELS & LINER PANELS

- A. Exterior wall panels and interior liner panels shall be as follows:
1. Exterior metal wall panels shall be:
 - a. Varco-Pruden "Vee" panels, 36" wide, 24 gauge, with KXL Kynar color finish over G90 galvanized steel, or equal. Finish shall be warranted for 20 years. Color to be selected.

DIVISION 13 – SPECIAL CONSTRUCTION
Section 13120 – Pre-Engineered Metal Building System

2. Interior metal liner panels shall be Varco-Pruden "VP Panel Rib" panels, 36" wide, 26 gauge, with "SP" painted finish, or equal. Color to be selected.

B. Exterior wall panels shall be installed with fasteners and sealants to provide a waterproof installation.

2.04 GUTTERS AND DOWNSPOUTS

A. Gutters and downspouts on the high roof area of the building shall be furnished and installed as a part of the pre-engineered metal building.

B. Gutters and downspouts on the high roof area shall be according to the metal building manufacturers standards, and shall be prefinished in color to be selected.

C. The top outside edge of all gutters shall be installed one inch (1") lower than the drip edge of the roof.

2.05 SNOWGUARDS

A. Snowguards shall be S-5 by ColorGard Tel. 888-825-3432 / www.S-5.com

2.06 INSULATION

A. Roof insulation shall be installed in two layers for total U-factor 0.036:

1. R-13 Roof Insulation upper layer

2. 8" R-25 Roof Insulation on Support Fabric and Banding

B. Insulation shall consist of SSR roof panels with Superblocks, which are 1" x 3½" extruded polystyrene thermal spacer strips capped by 22 gage galvanized channels. Polypropylene faced fiberglass blankets, 0.6 pcf density, shall be used for over-the-purlin installation. Vapor integrity is to be provided by faced fiberglass blankets. Facing is to be white vinyl.

C. Flame spread must be 25 or less with smoke developed 50 or less per UL 723 and ASTM E-84.

2.07 FASTENERS, MASTIC AND CLOSURES

A. Fasteners shall be self-drilling structural fasteners for panel to secondary conditions. Panel to panel connections shall be self-tapping screws.

B. Tube sealant shall be a synthetic elastomer based material which becomes tack-free in less than 2 hours at 75 degrees F., but remain flexible. Service range shall be -30 degrees F to 160 degrees F.

C. Tape mastic shall be pre-formed butyl rubber based compound. Service range shall be -30 degrees F. to 160 degrees F.

D. Panel closures shall be Ethylene-Propylene-Diene-Monomer or equivalent closed cell strips formed to match panel configuration.

E. Sealants, mastics and closures shall be applied in strict accordance with manufacturer's drawings.

2.08 ANCHOR BOLTS

DIVISION 13 – SPECIAL CONSTRUCTION
Section 13120 – Pre-Engineered Metal Building System

- A. Anchor bolts shall be sized to resist all shears and uplifts induced by the structure and shall not be less than the sizes shown on manufacturer's anchor bolt layout drawings. All anchor bolts shall be unpainted so as to bond with the concrete and shall be set in strict accordance with manufacturer's drawings.

2.09 FLASHING & TRIM

- A. Exposed flashings and trim shall be minimum 26 gauge and shall be of the same finish as the roof. Trim colors shall be as selected from the manufacturer's standard colors.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The erection of the metal building and the installation of accessories shall be performed in accordance with approved erection drawings by a qualified erector using proper tools, equipment, and methods.
- B. In addition, erection practices shall conform to Section 5, MBMA “Code of Standard Practice”. There shall be no field modifications to primary structural members except as authorized and specified by the manufacturer.

3.02 STRUCTURAL STEEL FABRICATION

- A. All structural steel members are to be sheared, formed, punched, and welded in the plant. All shop welding is to be in accordance with standard practices of the American Welding Society and shall be done by certified welders. Structural members fabricated of plate stock shall have the flanges and webs joined by a continuous automatic submerged arc welding process.
- B. All primary building frame connections shall be welded and/or bolted.
- C. Workmanship shall be such that the parts of the building are accurately made and true to dimension so that in erection of same all parts will properly fit together.
- D. All materials furnished shall be within the standard industry tolerances for that material as specified for the building and that stated design conditions.
- E. The size and weight of the building components as packaged and shipped shall be such that will permit transportation by common carrier.

3.03 CONSTRUCTION DETAILS

- A. All details relating to the pre-engineered structure, metal roofing, and flashing shall be approved by the manufacturer.
- B. Any details shown on the drawings which are not approved by the system manufacturer shall be altered as required to comply with the requirements for a certified and warranted installation, and without additional cost to the Owner.
- C. Particular attention is directed toward the methods of attachment to the existing building structure. Adequate allowances shall be included for any special members required, and field cutting and

DIVISION 13 – SPECIAL CONSTRUCTION
Section 13120 – Pre-Engineered Metal Building System

fitting to conform to the conditions which exist for attachment of the new construction to the existing building.

3.04 PAINTING

- A. All structural steel members shall be cleaned of oil, dirt, loose scale and foreign matter prior to painting.
- B. Shop primer shall be a nominal 1 mil thick and conform to Federal Specifications TT-P-664c and TT-P636c.
- C. All fabricated or purchased items shall have an identifying number corresponding to marking shown on erection drawings. The marking shall be stamped, stenciled, tagged, or printed on these items after shop paint has been applied.

3.05 LETTER OF CERTIFICATION

- A. The metal building manufacturer shall submit to the Architect a Letter of Certification stating that the building components are designed in accordance with the 1989 Edition of the AISC Specification for the Design, Fabrication and Erection of Structural Steel and the 1986 Edition of the AISI Specification for the Design of Cold-Formed Steel Structural Members. The basic loads of the subject building meet or exceed the County Climatic Data as published in the 1986 edition of the MBMA Low Rise Building System Manual.
- B. Indicate the design criteria for the following loads.
 - 1. Snow Load
 - 2. Wind Speed
 - 3. Wind Exposure
 - 4. Seismic Zone

3.06 FABRICATION WARRANTY

- A. The Pre-Engineered Building shall be warranted to conform to these specifications and against failure due to defective engineering, material, or workmanship for a period of three (3) years from date of delivery.
- B. The manufacturer shall issue to the Owner the following warranty on the standing seam metal roof system, commencing with the date of final inspection and acceptance. Warranty shall be delivered to the Architect's Office, and shall cover the following:
 - 1. Standing seam metal roofing system shall be warranted weathertight for a period of 20 years.
 - 2. Finish on metal roofing shall be warranted for 20 years against chalking, fading, blistering, peeling, and cracking when exposed to normal atmospheric conditions.

END SECTION 13120