SECTION 03100

WOOD FORMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in place concrete.

1.02 RELATED SECTIONS

A. Section 01450 – Quality Control.

B. Section 03200 – Concrete Reinforcement.

B. Section 03300 – Cast-in-Place Concrete.

1.03 REFERENCES

A. ACI 117 – Standard Tolerances for Concrete Construction Materials.

B. ACI 301 – Structural Concrete for Buildings.

C. ACI 318 – Building Code Requirements for Reinforced Concrete.

D. ACI 347 – Recommended Practice For Concrete Formwork.

E. PS 1 – Construction and Industrial Plywood, U.S. Department of Commerce.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Protect cement from moisture and humidity

1.05 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC requirements.

B. Maintain materials and surrounding air temperature to minimum 10 degrees C (40 degrees F) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 WOOD FORM MATERIALS

A. Plywood for Finish Concrete Exposed to View:

1. Conform to U.S. Product Standard PS-1, B-B Plywood for Concrete Forms, Class I, exterior grade, sound undamaged sheets with clean, true edges. Each piece shall bear legible inspection mark.

2. Use largest practicable sizes to minimize number of joints.
3. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

B. Plywood for Finish Concrete Not Exposed to View: Conform to U.S. Product Standard PS-1, Class II, C plugged, exterior grade, sound sheets.

C. Lumber: sound members of sufficient size and strength to support intended weight, straight edges for tight fit.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

3.02 ERECTION

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301 and ACI 347.

B. Construct forms to produce concrete of sizes, shapes, lines and dimensions shown, and obtain accurate alignment, location, grades, level of plumb work in finished structures.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principle shores.

3.03 FORM REMOVAL

A. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finished concrete surfaces scheduled for exposure.

B. Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent construction.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not e damaged.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT CHAIRS / POSITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcement bars for concrete beams.

B. Products for rebar.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms and Accessories

B. Section 03200 – Cast-in-place concrete.

C. Section 03200 – Reinforcing Bars: Concrete

1.03 REFERENCES

A. ASTM A 615 Grade 60 (ASTIM A 615M Grade 400), deformed

B. Reference Standards: See section 1420. In addition to requirements shown on specified comply with applicable provisions of following for each design, materials, fabrication, and installation of component parts.

1. ACI 318 – Building Code Requirements for Reinforced Concrete.

2. CRSI MSP-2 – Manual of Standard Practice for Reinforced Concrete Construction.

C. Heckmann Building Products Inc.

1. www.heckmannbuildingprods.com

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

1. Store and maintain reinforcing chairs and positioners to prevent rusting, contamination, or bending.

PART 2 PRODUCTS

2.01 MATERIALS

A. No. 374 STEELWICH™ CMU Telescoping Rebar Positioner™. (Patent Pending) "The Original Telescoping Rebar Positioner"™

B. Acceptable Manufacturer:

1. Heckmann Building Products Inc.

   1501 N. 31st Avenue. Melrose Park, IL 60160

   Tel: (708) 865-2403 Fax: (708) 865-2640

   E-mail: Heckmann@worldnet.att.net

   Website Address: www.heckmannbuildingprods.com

PART 3 EXECUTION

3.01 INSTALLATION

A. Install steelwich telescoping rebar positioner in accordance to manufacturer's instructions.

1. Vertically adjust the hooked rebar into place over the horizontal bond beam rebar and lock it down.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 03200

Concrete Reinforcement

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcement bars for concrete beams.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete forms and accessories.

B. Section 03200 – Cast-in-place concrete.

1.03 REFERENCES

A. Reference Standards: See section 1420. In addition to requirement shown or specified comply with the applicable provisions of the following for each design, material, fabrication and installation of component parts.

1. ACI 117 – Standard for Concrete Construction and Materials.

2. ACI 301 – Specifications for Structural Concrete for Buildings.

3. ACI 318 – Building Code Requirements for Reinforced Concrete.

4. CRSI MSP-2 – Manual of Standard Practice for Reinforced Concrete Construction.

1.04 QUALITY ASSURANCE

A. Certifications:

1. Mill test certificates of supplied reinforcing, indicating physical and chemical analysis for each sample delivered.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01600.

1. Store and maintain steel and bar supports to prevent rusting, contamination, or bending.

2. Store reinforcing steel off the ground and on blocks.

PART 2 PRODUCTS

2.01 REINFORCING MATERIALS

A. Reinforcing Bars {3200.A}

1. Deformed Bars: ASTM A615

a. Grade 60, unless indicated otherwise.

2. Standard finish, unless indicated otherwise.

2.02 FABRICATION

A. Reinforcing Bars {3200.A}: Fabricate in accordance with ACI 315.

B. Reinforcing with one or more of the following defects is not allowed:

1. Bar length or bends exceeding specified fabrication tolerances.

2. Bends or kinks not shown on drawings.

3. Bars with reduced cross-section or reduced deformations.

4. Bars with heavy rust coating of flakes or scaled which dislodge when bar is struck with hammer.

2.03 FINISHES

A. Reinforcing:

1. Provide plain reinforcing at typical interior locations unless indicated otherwise.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine conditions and process with work in accordance with Section 01400.

3.02 PREPARATION

A. Clean reinforcing of thick rust, loose rust and loose mill scale, dirt and oil.

3.03 INSTALLATION

A. Reinforcing Bar Placement {03200.A}: Comply with CRSI Recommended Practice for placing Reinforcing Bars and ACI 318.

1. Maintain minimum concrete cover of reinforcement per ACI 318, unless otherwise

indicated on drawings.

2. Bending of reinforcement with is partially embedded in hardened concrete will not be permitted, unless other indicated.

3. Do not use supported reinforcing as runway for concrete conveying equipment and similar construction loads.

3.04 FIELD QUALITY CONTROL

A. Field Inspection will be performed in accordance with Section 01451.

B. Responsibilities of Testing and Inspection Agency.

1. Verify reinforcing size, lengths, position, shapes, spacing and number of bars.

2. Verify reinforcing type, grade, finish and cleanness.

3. Verify concrete cover to formwork and top slabs

4. Verify type, finish, locations, height of bar supports and spacers.

5. Inspect Splices.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT CHAIRS / POSITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcement bars for concrete beams.

B. Products for rebar.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms and Accessories

B. Section 03200 – Cast-in-place concrete.

C. Section 03200 – Reinforcing Bars: Concrete

1.03 REFERENCES

A. ASTM A 615 Grade 60 (ASTIM A 615M Grade 400), deformed

B. Reference Standards: See section 1420. In addition to requirements shown on specified comply with applicable provisions of following for each design, materials, fabrication, and installation of component parts.

1. ACI 318 – Building Code Requirements for Reinforced Concrete.

2. CRSI MSP-2 – Manual of Standard Practice for Reinforced Concrete Construction.

C. Heckmann Building Products Inc.

1. www.heckmannbuildingprods.com

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

1. Store and maintain reinforcing chairs and positioners to prevent rusting, contamination, or bending.

PART 2 PRODUCTS

2.01 MATERIALS

A. No. 374 STEELWICH™ CMU Telescoping Rebar Positioner™. (Patent Pending) "The Original Telescoping Rebar Positioner"™

B. Acceptable Manufacturer:

1. Heckmann Building Products Inc.

   1501 N. 31st Avenue. Melrose Park, IL 60160

   Tel: (708) 865-2403 Fax: (708) 865-2640

   E-mail: Heckmann@worldnet.att.net

   Website Address: www.heckmannbuildingprods.com

PART 3 EXECUTION

3.01 INSTALLATION

A. Install steelwich telescoping rebar positioner in accordance to manufacturer's instructions.

1. Vertically adjust the hooked rebar into place over the horizontal bond beam rebar and lock it down.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 03300

CAST IN PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast-in-Place Concrete for concrete beams.

1.02 RELATED SECTIONS

A. Section 01450 – Quality Control

B. Section 03100 – Wood Forms

C. Section 03200 – Concrete reinforcement

C. Section 03350 – Concrete Finishing

1.03 REFERENCES

A. ACI 301 – Structural Concrete for Buildings.

B. ACI 304 – Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

C. ACI 306R – Cold Weather Concreting.

D. ACI 318 – Building Code Requirements for Reinforced Concrete.

E. ASTM C94 – Ready-Mixed Concrete.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Protect cement from moisture and humidity.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC requirements.

B. Maintain materials and surrounding air temperature to minimum 10 degrees C (40 degrees F) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Ready-Mix Concrete.

B. Water: Clean and potable.

2.02 READY-MIX CONCRETE

A. Comply with requirements of ASTM C94.

PART 3 EXECUTION

3.01 INSTALLATION

A. Place Concrete in accordance with ACI 301, ACI 304, ACI 305, ACI 306, and ACI 318.

3.02 PROTECTION AND CURING

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury

B. Cure concrete under provisions of Section 3390 – Concrete Curing

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01450.

END OF SECTION

SECTION 03310

CONCRETE WORK

PART 3 - EXECUTION

3.07 PREPARATION OF FORM SURFACES

A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before reinforcement is placed.

B. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

C. Coat steel forms with non-staining, rust-preventative material. Rust-stained steel formwork is not acceptable.

D. Form Release Agent: shall be of a non-staining and non-emulsifiable type, or equal approved by Designer. Form release agent shall not impart any stain to concrete nor interfere with adherence of any material to be applied to concrete surfaces.

3.09 FINISH OF FORMED SURFACES

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated.

1. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding ¼" in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, such as waterproofing, damp proofing, painting or other similar system.

1. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams.

C. Related Unformed Surfaces: At horizontal offsets surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

SECTION 03361

CONCRETE STAMPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Textured concrete slabs.

1.02 RELATED SECTIONS

A. Section 02775 - Sidewalks.

B. Section 03300 - Cast-In-Place Concrete.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's catalog data, detail sheets, and printed instructions.

1.04 QUALITY ASSURANCE

A. Mock-Up: Provide 4 foot by 4 foot (1.2 x 1.2 m) mock-up to demonstrate methods of obtaining consistent visual appearance.

1. Construct at least one month before start of actual work, using materials and methods to be used in actual work.
2. Locate mock-up on site.
3. Retain samples of materials used in mock-up for comparison with materials used in remaining work.
4. Accepted mock-up constitutes visual standard for work.
5. Mock-up may remain.

Remove mock-up when no longer required for comparison with finished work. Deliver products to site under provisions of Section 01600.

B. Preconstruction Conference: Conduct a review of procedures required to produce results.

PART 2 PRODUCTS

2.01 MATERIALS

A. Color Hardener

B. Color Release

C. Stamping Tool: Complete kit of urethane molded pattern with nylon straps for handling.

2.02 CONCRETE STAMPING SYSTEM

A. Design-Crete(tm) materials and procedures
B. Ensure uniform concrete mix as follows:
   1. Design: 4,000 psi (27.6 MPa) compressive strength, low slump.
   2. Air Entrainment: 3 percent maximum.
   3. Do not use excessive superplasticizers.
   4. Do not use calcium chloride or non-chloride accelerators. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270, Type N, using proportion method.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color in accordance with manufacturer’s instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

PART 3 EXECUTION

3.01 PREPARATION

A. Plan pattern layout; coordinate slab dimensions and construction joint locations with stamping pattern dimensions where necessary.

3.02 INSTLATION

A. Follow manufacturer's printed instructions,

B. Broadcast color hardener evenly over freshly screeded and floated concrete surface; work color hardener into concrete surface, integrating color with the concrete.

C. Broadcast additional material to intensify the final color appearance, if necessary, working material into the surface.

D. Monitor concrete set time carefully. When concrete is set adequately to support worker's weight, broadcast color release evenly over the slab surface at the rate of 3 pounds per 100 square feet (1.46 kg per 10 square m).

E. Begin stamping operation using stamping tool kit. Work quickly and continuously across entire pour.
   1. Place each tool on slab surface, aligned with each other and slab edges as pattern requires.
   2. Step on back of stamping tool to create full depth impression in concrete.

3. Use special half tools and texture mats at slab edges, walls, and corners.
4. Broom texture surface where required.

F. Rinse residual release from surface once slab has set.

G. Apply decorative sealer following manufacturer's directions.

END OF SECTION

SECTION 03390

CONCRETE CURING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes initial and final curing with spray-on of vertical concrete surfaces.

1.02 REFERENCES

A. American Concrete Institute (ACI)
1. ACI 301 – Specification for structural concrete
2. ACI 302.1 – Guide for concrete floor and slab construction
3. ACI 308 – Standard Practice for curing concrete

B. American Society for Testing and Material (ASTM_
1. ASTM C309 – Liquid membrane-forming compounds for curing concrete

1.03 SUBMITTIALS

A. Product Data: Submit data on curing compounds, mats, compatibilities, and limitations.

B. Quality Assurance Submittals: Approval letters from the subsequent floor finish installers.

1.04 QUALITY ASSURANCE

A. Perform Working accordance with ACI 301 and ACI 302.1

PART 2 PRODUCTS

2.01 COMMPONENTS

A. Spray on Curing compound
1. Covertex Powder by C.T.I. Consultants Pty. Ltd
2. Covertex Catalyst by C.T.I. Consultants Pty. Ltd
3. Colour component

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify Substrate ready to be cured
3.02 PREPARING CURING COMPOUND
A. Complete bag of Covertex Powdered is used for preparing these panels

B. Half the bag is poured into a mixing vessel, followed by 3 liters of Covertex Catalyst

C. After stirring to produce a uniform mixture, the remainder of the powder was added, together with the colour component

D. Additional catalyst was used to rinse out the colour container and to adjust the mix to the required consistency

E. A total of 3.6 litres of Catalyst was used in the mix

F. The mix was left to stand for 2 minutes, and was then re-stirred. The mix was transferred to the hopper on a down-ward angled spray gun fitted with a 20 thou orifice and adjustable fan width

G. The material was sprayed onto the panels until an even layer of about 3 mm thickness was present on all parts of the panels.

H. When the spray-applied Covertex was dry to touch, it was sealed by application of a coat of Texcrete Clear Sealer, applied by brush.

END OF SECTION

SECTION 04090
MASONRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mortar dropping collection device for masonry cavity walls.

1.02 RELATED SECTIONS

A. Section 04200 - Unit Masonry: Division 4 Unit Masonry Assembly Section.
B. Section 07190 - Wall Flashing: Division 7 Flashing Section.

1.03 REFERENCES

A. MORTAR NET CAVITY WALL SPECIFICATIONS -
WWW.MORTARNET.COM

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
B. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
C. Do not expose material to direct sunlight for more than 2 weeks. If material is protected from exposure to direct sunlight it may be stored indefinitely.

1.05 ENVIRONMENTAL REQUIRMENTS

A. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
B. Do not expose material to direct sunlight for more than 2 weeks. If material is protected from exposure to direct sunlight it may be stored indefinitely.

PART 2 PRODUCTS

2.01 MATERIALS

A. All dimensions are nominal. Measurements are inclusive of the continuous bottom strip and the dovetail shape.
B. Four available sizes: 1" (25.4 mm) and 0.4" (10.2 mm) thicknesses by 10" (254 mm) height by 5' (1524 mm) long. 2" (51 mm) thick by 10" (254 mm) x 5' (1524 mm) long.
C. Continuous bottom strip on all sizes of material is 3" (76.2 mm) high, regardless of material thickness or overall material height.

D. 1” (25.4 mm) thick product is high density polyethylene (HDPE), 0.4” (10.2 mm) thick product is nylon, and 2” (51 mm) thick material is recycled polyester. Product is a 90% open weave mesh in a dovetail configuration connected by a continuous bottom strip.

PART 3 EXECUTION

3.01 INSTALLATION

A. Mortar Net Installation:
   a. For most walls, install 1 continuous row of The Mortar Net at base of wall and over all wall openings directly on flashing.
   b. To prevent mortar bridging between the outer wythe and inner wall, install flashing extending from the bottom of The Mortar Net to at least 6” (152 mm) above the top of The Mortar Net.
   c. Multiple thicknesses of The Mortar Net may be installed to match cavity widths and if excessive droppings are expected. Inspection, preparation and installation procedure for multiple thicknesses is the same as for single thickness. When installing multiple thicknesses, align the dovetail sections with each other.
   d. To match cavity width to product thickness without using multiple thicknesses of The Mortar Net, place rigid insulation of appropriate thickness against outside face of inner wall.
   e. Lay the first 1 or 2 courses of brick at flashing level, then install The Mortar Net continuously by placing it against the inside of the openings. No fasteners or adhesives are rquired, and mortar need not have set.
   f. The Mortar Net shall not come in contact with wall ties standard wall tile installations, but if it does, it may be cut or torn to accommodate wall ties, conduit, plumbing or other materials that bridge or intrude into cavity between inner and outer walls.
   g. Compress The Mortar Net horizontally so it can be forced into cavities slightly smaller than its nominal thickness without affecting Mortar Net or wall performance.

3.02 PROTECTION

A. Protection: Protect installed product from damage during construction.

END OF SECTION

Weep holes

SECTION 04090

WEEPHOLES, FOR MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Weep holes

B. Wicking materials.

1.02 RELATED SECTIONS

A. Division 7 Section “Sheet Metal Flashing and Trim” for exposed sheet metal flashing.

1.03 REFERENCES

A. Fundamentals of Building Construction: Materials and Methods (Edward Allen, Joseph Iano)

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

PART 2 PRODUCTS

2.01 MATERIALS

A. Plastic Weep Holes

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Use round or rectangular plastic tubing and wicking materials to form weep holes.

2. Use wicking material to form weep holes above flashing in sills. Turn wicking down at lip of sill to be as inconspicuous as possible.

3. Space weep holes formed from plastic tubing or wicking material 16 inches (400mm) o.c.

4. in cavities, place pea gravel to a height equal to height of first course, but not less than 2 inches (50mm), immediately above top of flashing embedded in the wall, as masonry construction progresses, to splatter mortar droppings and to maintain drainage.

4. Place cavity drainage material immediately above flashing in cavities.

C. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 04100
BRICK MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bricks for masonry.

1.02 RELATED SECTIONS

A. Section 04200 – Masonry Units

B. Section 04810 – Unit Masonry Wall Assemblies

1.03 REFERENCES

A. ASTM C91 - Standard Specification for Masonry Cement

B. ASTM C150 - Standard Specification for Portland Cement

C. ASTM C216 - Standard Specification for Facing Brick

D. ASTM E835/E835M - Standard Guide for Modular Coordination of Clay and Concrete Masonry Units

E. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Masonry Construction.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Protect cement from moisture and humidity

1.05 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC requirements.

B. Maintain materials and surrounding air temperature to minimum 10 degrees C (40 degrees F) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Normal – Type I, white color for facebrick and grey color for common brick

B. Mortar aggregate: ASTM C144, standard masonry type; clean dry; protected from dampness, freezing, or foreign matter.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and potable.

E. Mortar Color: Mineral oxide pigment; chocolate brown color; “Great Stuff” manufactured by Acme Manufacturing Co. Ltd.

2.02 MIXES

A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using proportion method.

B. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270, Type N, using proportion method.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color in accordance with manufacturer’s instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install masonry in conjunction with Sections 04200.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 04200.

END OF SECTION

SECTION 04100

MASONRY MORTAR

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mortar for unit masonry and stone veneer.

1.02 RELATED SECTIONS

A. Section 04200 – Unit Masonry: Mortar for concrete unit masonry.

B. Section 04450 – Stone Veneer: Mortar for natural stone veneer.

1.03 REFERENCES

A. ASTM C150 – Portland Cement.

B. ASTM C144 – Aggregate for Masonry Mortar.

C. ASTM C207 – Hydrated Lime for Masonry Mortar

D. ASTM C270 – Mortar for Unit Masonry

E. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Protect cement from moisture and humidity

1.05 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC requirements.

B. Maintain materials and surrounding air temperature to minimum 10 degrees C (40 degrees F) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Normal – Type I, white color for facebrick and grey color for common brick

B. Mortar aggregate: ASTM C144, standard masonry type; clean dry; protected from dampness, freezing, or foreign matter.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and potable.

E. Mortar Color: Mineral oxide pigment; chocolate brown color; "Great Stuff" manufactured by Acme Manufacturing Co. Ltd.

2.02 MIXES

A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using proportion method.

B. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270, Type N, using proportion method.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install mortar in conjunction with Sections 04200 and 04450.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 05090

METAL GUSSET PLATE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal gusset plates, used as wood fasteners, for assembling a wood truss.

1.02 RELATED SECTIONS

A. Section 06100 – Rough Carpentry: Gusset plates for use with wood trusses.

1.03 REFERENCES

A. ASTM A36 – Metal Fasteners

B. Section 05120 – Structural Steel

C. Section 06170 – Wood Trusses

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products as recommended in specifications.

B. Store products and avoid exposure to moisture, condensation, and the possibility for corrosion.

1.05 SUBMITTALS

A. Product Data for each type of plate.

B. Shop drawings showing layout, type, location, and spacing.

C. Material certificates signed by manufacturers certifying that trusses and placement of plates on trusses comply with specifications.

D. Certificates from nail/bolt company certifying their products comply with specified requirements.

1.06 SEQUENCING

A. Deliver steel plates and other fasteners to be built into truss framework.

PART 2 PRODUCTS

2.01 MATERIALS

A. Metal Gusset Plates : ASTM A36

B. Nails: FS FF-N-105

2.02 MANUFACTURERS

A. All materials shall be equal to those manufactured by Marino/Ware Industries.

PART 3 EXECUTION

3.01 INSTALLATION

A. Use gusset plates on both sides of each joint.

B. Use full width plywood panels on both sides for box beams.

C. Assemble and bond the braces and gussets in place with epoxy/adhesive filler, nails, or other fasteners. Use screws and nails to hold.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 05200 - STEEL JOISTS AND JOIST GIRDERS

PART 1: GENERAL

1.01 SCOPE OF STANDARD

A. This standard provides general guidance concerning the specific preference of the owner for the design, fabrication and erection of steel joist and/or joist girder structural systems.

1.02 RELATED STANDARDS

A. Structural Systems
B. Structural Steel
C. Coatings and Paint Systems

1.03 REFERENCE STANDARDS

A. AISC Specification for Structural Steel Buildings.
B. AISC Code of Standard Practice for Steel Buildings and Bridges.
C. Steel Joist Specifications.
D. AISC Manual of Steel Construction.
E. American Welding Society (AWS) D1.1 – Structural Welding Code – Steel.
F. American Society for Testing Materials (ASTM) – Standard Specifications.

1.04 QUALITY CONTROL

A. The steel joist fabricator shall provide evidence of successful fabrication of steel joist systems of similar size and complexity for a continuous period of at least five years immediately prior to the bid date. The joist fabricator shall also employ and have on staff a qualified structural engineer to prepare design calculations, shop drawings, and other structural data for steel joist and joist girders.
B. The steel joist erector shall provide evidence of successful erection of steel joist systems of similar size and complexity for a continuous period of at lease five years immediately prior to the bid date.
C. Qualifications for welding work: All welders and welding processes shall be qualified in accordance with AWS "Standard Qualification Procedure." All welders shall have passed AWS qualification tests within the past six months.
D. The joist erector is required to visit the project site at least 30 days prior to start of erection to review existing site conditions such as site access, clearances, utilities, adjacent structures, overhead obstructions, site topography and security requirements.

1.05 SUMBITTALS

A. Fabricator shall submit, as the minimum, the following:
    a. Mill certificates for all steel members
    b. Complete shop drawings, including placement plans, member sizes, connections, connection details, bill of materials, dimensions of materials, dimensions of members and splice locations.
    c. All primers, coatings and cleaning methods.

d. Submit shop drawings and calculations for all steel structural members signed and sealed by the qualified Registered Professional Engineer responsible for their preparation.

PART 2: PRODUCTS

2.01 GENERAL

A. All steel shall be domestically manufactured, unless foreign sources are accepted by the owner.

B. Primer paint shall be compatible with subsequent paint systems to be applied.

PART 3: EXECUTION

3.01 ERECTION

A. Prior to erection, erector shall check elevations of concrete and masonry bearing surfaces, locations of anchor bolts and similar devices before proceeding with erection. Report any discrepancies to U.T. project representative.

B. Erector is responsible for all temporary shoring and bracing.

C. Level and plumb individual members and steel frame to within AISC tolerances.

3.02 QUALITY CONTROL

A. The owner will contract with an independent testing agency to provide inspection services during the course of this project. The fabricator and erector shall provide access to all parts of the work for inspection by the testing agency to accomplish its work. The testing agency may require access to the fabricators shop at any time during fabrication or just prior to shipment of the steel joists and/or steel girders.

B. The owner reserves the right to reject any and all materials or workmanship not complying with specified requirements at any time.

C. Fabricator and/or Erector shall correct all deficiencies and work which is not in compliance with the specified materials. Any additional testing or inspection costs will be at the expense of the fabricator/erector.

PART 4: DESIGN

4.01 GENERAL

A. In the design of steel joist and joist girder systems, the design engineer shall take into consideration the future flexibility of the system and the need to make frequent modifications to building systems.

4.02 DESIGN

A. Refer to U.T. Structural Systems standard for design loads.

B. Live load reduction shall be in accordance with the U.T. Structural Systems standard.

C. Deflections – unless approved by the U.T. Structural Engineer, steel member deflections shall be limited to the following:

Live Load Only L / 360

Dead Load + Live Load L / 240

In addition, the engineer should give due consideration to the control of excessive floor vibration and to the control of pounding on roofs. The engineer shall also consider the effect of deflections on architectural finishes attached to the structural members.

D. Floor Slabs on Metal Deck – Floor slabs may be designed as either composite or non-composite systems. The minimum slab thickness above the metal deck should be at least 3 inches. It is preferable that the concrete thickness be increased to provide any required fire separation rather than fireproofing the bottom of the metal deck.
E. Lateral Forces – In the design of steel joist and/or joist girder systems for lateral loads, the use of a braced frame is preferred in order to reduce the chance of cracking in brittle finishes. The use of a Moment Resisting Frame to resist lateral forces is at the discretion of the U.T. Structural Engineer.
F. Full Penetration Welding – Full penetration welds are often required and even desirable for many steel connections. However, the use of full-penetration welding should be limited due to both cost and testing requirements. The engineer should give consideration to these factors when designing steel connections.
G. Joist Bridging – All joist bridging shall be designed by the joist manufacturer. Joist bridging shall conform to all OSHA requirements for erection stability.

4.03 SYSTEMS TO AVOID

A. Avoid steel joist systems with excessive span/depth ratios. Deflections should be kept within acceptable limits.
B. Avoid the use of A-490 bolts
C. Steel yield strengths greater than 50 ksi.

END OF STANDARD 05200

SECTION 05400

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior load-bearing steel stud wall systems and light gauge framing.

B. Runner tracks, bridging, bracing, anchorages, welds or mechanical fastening and other accessories or attachments shown or required to complete installation of cold-formed metal framing.

1.02 RELATED SECTIONS

A. Section 03300 – Cast-in-Place Concrete: Concrete slab over decking and at stair pans.

B. Section 05120 – Structural Steel.

C. Section 05720 – Ornamental Stair and Railing.

1.03 DESIGN CRITERIA FOR EXTERIOR WALLS

A. Performance/Design Requirements: Employ a Professional Engineer registered in the State of Pennsylvania to design and engineer exterior wall framing systems and interior load bearing framing systems in compliance with the following criteria.

1. Calculate structural properties of studs to comply with AISI "Specification for the Design of Cold-Formed Steel Structural Members."

2. Stud spacing and connections indicated represent minimum acceptable system. Maintain stud and joist depths indicated.

3. Design and provide complete system, including but not limited to, wall framing, supplemental secondary framing, connections to receive attachments and shapes as indicated or required.

a. Slide clip and gravity connectors at angled studs to resist both horizontal wind loads and horizontal component of wall weight (dead loads).

4. Lateral deflection of studs under design loadings: Not over L/360 of their unsupported height for metal panels stud back up. Not over L/600 of their unsupported height for stone wall back up.

1.04 QUALITY ASSURANCE

A. Inspection and Quality Control: Steel framing manufacturer shall provide qualified representative for periodic on-site review of fabrication and installation in accordance with manufacturer's recommendations.

B. Welding: Use qualified welders and comply with American Welding Society (AWS) D1.3, "Structural Welding Code – Sheet Steel".

C. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for fire-resistance ratings, including those required for compliance with governing regulations, provide units which have been approved by governing authorities having jurisdiction.

1.05 DELIVERY AND STORAGE

A. Protect metal framing units from rusting and damage. Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off ground in dry ventilated space or protect with suitable waterproof covering.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Acceptable Manufacturers:

1. Inryco Architectural Products Division, Butler Manufacturing.
2. Unimast, Incorporated.
3. Ceco Corporation.
4. Dietrich Industries, Inc.
5. Gold Bond Building Products Div., National Gypsum Company.
6. Keene Corp.: Screw Cee Studs.
7. United States Gypsum Company: Light Steel Studs.
8. United States Steel Corporation.

2.02 MATERIALS

A. Studs: Galvanized, 16 gauge, unless otherwise indicated, formed from steel that corresponds to minimum requirements of ASTM A653, with minimum yield of 33,000 psi, "C"-shaped with flange and flange return lip. Studs shall be punched studs having spaced openings centered along webs. Maximum spacings shall be 16 inches on centers.

B. Track: Galvanized; channel shaped; same width as studs for tight fit; solid web. Steel properties and gauge shall match studs.

C. Exterior Gypsum Sheathing (GYP.SHTG-1): Conforming to ASTM C79(with water-resistant core and Fed. Spec. SS-L-30d, Type II, Grade X; 4 foot by 8 foot sheets with square edges.

1. Thickness: 5/8 inch thick, unless otherwise indicated.

2.03 ACCESSORIES

A. Bracing and Bridging: Formed from galvanized steel sheets, gauge as required with 20-gauge minimum.

B. Plates, Gussets, Clips: Formed from galvanized steel sheets, gauge as required for conditions encountered, manufacturer's standard shapes.

C. Slide Clip: 14 gauge, 1-3/4 inch by 2-1/4 inch.

D. Self-drilling self-tapping screws, bolts, nuts and washers: Hot-dip galvanized: ASTM A153.

E. Anchorage Devices: Power driven or powder actuated, drilled expansion bolts; or screws with sleeves.

F. Welding: AWS D1.1

G. Membrane Flashing: Refer to Section 07650.

H. Sill Flashing: Galvanized sheet steel, ASTM A653, G-90 coating, both sides prime painted.

2.04 FINISHES

A. Galvanizing: Studs, track, bridging, bracing and accessories shall be formed from steel having G-60 galvanized coating meeting requirements of ASTM A924.

B. Primer: FS MIL-P-26915A touch-up for galvanized surfaces. Use Z.R.C. Cold Galvanizing Compound.

2.05 FABRICATION

A. Galvanized, touch up, and prime paint metal materials used on exterior wall framing

B. Fabricate assemblies of sizes and profiles required, with joints fitted, and secured, reinforced, and braced to suit design requirements.

C. Components may be prefabricated into panels prior to erection. Prefabricated panels shall be square, with components attached by welding to prevent racking. Handling and lifting of panels shall be done in manner as to not cause distortion.

D. Cut framing components square for attachment to perpendicular members, or as required for angular fit against abutting members. Hold members positively in place until properly fastened.

E. Assemble studs in manner which will assure that stud ends are positioned against inside track prior to stud and track attachment.

PART 3 EXECUTION

3.01 ERECTION

A. Clean surfaces which will be in contact after assembly.

B. Position members plumb, square and true to line.

C. Install flashing under sill track where bottom track is set flush with foundation wall. Seal laps watertight.

D. Seat studs in track with stud web and flange abutting track web.

E. At intersecting or abutting track joints, securely anchor abutting pieces of track to structure or splice them together.

F. Framed wall opening shall include properly designed lintel and multiple studs at edges of opening to compensate for those removed.

G. Perform welding in accordance with AWS D1.1.

H. Erect studs, brace, and reinforce to develop full strength to meet design requirements.

I. Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.

J. Align top and bottom tracks, locating to wall layout. Secure in place with screws, anchors or welding as required. Provide fasteners at corners and ends of tracks.

K. Set studs plumb at 16 inches o.c., unless otherwise indicated and not more that 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clips and ties, screws, or welding, in accordance with manufacturer's recommendations.

L. Construct corners using minimum 3 studs. Double studs at door, window and sidelight jambs. Install intermediate studs above and below opening to match wall stud spacing.

M. Top Track – Flexible Head Detail: Provide flexible connection between top runner channel secured to underside of slab and vertical studs to accommodate slab edge deflection and long term building creep without transferring axial load to studs.

1. Do not screw gypsum sheathing to top 6 inches of studs or along top runner.

2. Refer to slip track connection indicated on Drawings. If not specifically detailed, then provide either of the following:

a. Oversized runner track: 16 gauge within 10 feet from corners and not less than 18 gauge at all locations.

1) Slip second header channel inside oversized track

2) Slip connection: Allow for not less than 1/2 inch total movement

b. Runner track with extended verticals: Provide cold-formed channel welded to each stud at top diamond opening and slipped into runner.

c. Allow for 1/2 inch total movement.

N. Attach cross studs or furring channels to studs for attachment of items anchored to walls.

O. Erect studs one piece full length. Splicing and wire tying of framing components is not permitted.

P. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

Q. Make provision for erection stresses. Provide temporary alignment and bracing. Touch-up field welds and scratched or damaged galvanizing with galvanizing repair paint.

R. Exterior Sheathing: Install sheathing vertically with end joints occurring over studs. Screw attach gypsum sheathing to exterior of each stud with fasteners and spacing as recommended by sheathing manufacturer.

1. At contractor's option, select from either of the following methods to seal joints.

a. Apply full bead of silicone sealant around each piece of sheathing and at perimeter of interface with other materials and trowel flat.

b. Apply fiberglass joint tape over sheathing joints, corners, and other perimeter of interface with other materials.

2. Apply membrane flashing horizontally to face of sheathing with upper sheets lapped over lower sheets. Lap vertical joints not less than 6 inches and horizontal joints not less than 5 inches.

   a. Coordinate with other flashing materials.

END OF SECTION

SECTION 05400

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior load-bearing steel stud wall systems and light gauge framing.

B. Runner tracks, bridging, bracing, anchorages, welds or mechanical fastening and other accessories or attachments shown or required to complete installation of cold-formed metal framing.

1.02 RELATED SECTIONS

A. Section 03300 – Cast-in-Place Concrete: Concrete slab over decking and at stair pans.

B. Section 05120 – Structural Steel.

C. Section 05720 – Ornamental Stair and Railing.

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2. Stud spacing and connections indicated represent minimum acceptable system. Maintain stud and joist depths indicated.

3. Design and provide complete system, including but not limited to, wall framing, supplemental secondary framing, connections to receive attachments and shapes as indicated or required.

a. Slide clip and gravity connectors at angled studs to resist both horizontal wind loads and horizontal component of wall weight (dead loads).

4. Lateral deflection of studs under design loadings: Not over L/360 of their unsupported height for metal panels stud back up. Not over L/600 of their unsupported height for stone wall back up.

1.04 QUALITY ASSURANCE

A. Inspection and Quality Control: Steel framing manufacturer shall provide qualified representative for periodic on-site review of fabrication and installation in accordance with manufacturer's recommendations.

B. Welding: Use qualified welders and comply with American Welding Society (AWS) D1.3, "Structural Welding Code – Sheet Steel".

C. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for fire-resistance ratings, including those required for compliance with governing regulations, provide units which have been approved by governing authorities having jurisdiction.

1.05 DELIVERY AND STORAGE

A. Protect metal framing units from rusting and damage. Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off ground in dry ventilated space or protect with suitable waterproof covering.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Acceptable Manufacturers:

1. Inryco Architectural Products Division, Butler Manufacturing.
2. Unimast, Incorporated.
3. Ceco Corporation.
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7. United States Gypsum Company: Light Steel Studs.
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2.02 MATERIALS

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B. Track: Galvanized; channel shaped; same width as studs for tight fit; solid web. Steel properties and gauge shall match studs.

C. Exterior Gypsum Sheathing (GYP.SHTG-1): Conforming to ASTM C79(with water-resistant core and Fed. Spec. SS-L-30d, Type II, Grade X; 4 foot by 8 foot sheets with square edges.

1. Thickness: 5/8 inch thick, unless otherwise indicated.

2.03 ACCESSORIES

A. Bracing and Bridging: Formed from galvanized steel sheets, gauge as required with 20-gauge minimum.

B. Plates, Gussets, Clips: Formed from galvanized steel sheets, gauge as required for conditions encountered, manufacturer's standard shapes.

C. Slide Clip: 14 gauge, 1-3/4 inch by 2-1/4 inch.

D. Self-drilling self-tapping screws, bolts, nuts and washers: Hot-dip galvanized: ASTM A153.

E. Anchorage Devices: Power driven or powder actuated, drilled expansion bolts; or screws with sleeves.

F. Welding: AWS D1.1

G. Membrane Flashing: Refer to Section 07650.

H. Sill Flashing: Galvanized sheet steel, ASTM A653, G-90 coating, both sides prime painted.

2.04 FINISHES

A. Galvanizing: Studs, track, bridging, bracing and accessories shall be formed from steel having G-60 galvanized coating meeting requirements of ASTM A924.

B. Primer: FS MIL-P-26915A touch-up for galvanized surfaces. Use Z.R.C. Cold Galvanizing Compound.

2.05 FABRICATION

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B. Fabricate assemblies of sizes and profiles required, with joints fitted, and secured, reinforced, and braced to suit design requirements.

C. Components may be prefabricated into panels prior to erection. Prefabricated panels shall be square, with components attached by welding to prevent racking. Handling and lifting of panels shall be done in manner as to not cause distortion.

D. Cut framing components square for attachment to perpendicular members, or as required for angular fit against abutting members. Hold members positively in place until properly fastened.

E. Assemble studs in manner which will assure that stud ends are positioned against inside track prior to stud and track attachment.

PART 3 EXECUTION

3.01 ERECTION

A. Clean surfaces which will be in contact after assembly.

B. Position members plumb, square and true to line.

C. Install flashing under sill track where bottom track is set flush with foundation wall. Seal laps watertight.

D. Seat studs in track with stud web and flange abutting track web.

E. At intersecting or abutting track joints, securely anchor abutting pieces of track to structure or splice them together.

F. Framed wall opening shall include properly designed lintel and multiple studs at edges of opening to compensate for those removed.

G. Perform welding in accordance with AWS D1.1.

H. Erect studs, brace, and reinforce to develop full strength to meet design requirements.

I. Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.

J. Align top and bottom tracks, locating to wall layout. Secure in place with screws, anchors or welding as required. Provide fasteners at corners and ends of tracks.

K. Set studs plumb at 16 inches o.c., unless otherwise indicated and not more that 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clips and ties, screws, or welding, in accordance with manufacturer's recommendations.

L. Construct corners using minimum 3 studs. Double studs at door, window and sidelight jambs. Install intermediate studs above and below opening to match wall stud spacing.

M. Top Track – Flexible Head Detail: Provide flexible connection between top runner channel secured to underside of slab and vertical studs to accommodate slab edge deflection and long term building creep without transferring axial load to studs.

1. Do not screw gypsum sheathing to top 6 inches of studs or along top runner.

2. Refer to slip track connection indicated on Drawings. If not specifically detailed, then provide either of the following:

a. Oversized runner track: 16 gauge within 10 feet from corners and not less than 18 gauge at all locations.

1) Slip second header channel inside oversized track

2) Slip connection: Allow for not less than 1/2 inch total movement

b. Runner track with extended verticals: Provide cold-formed channel welded to each stud at top diamond opening and slipped into runner.

c. Allow for 1/2 inch total movement.

N. Attach cross studs or furring channels to studs for attachment of items anchored to walls.

O. Erect studs one piece full length. Splicing and wire tying of framing components is not permitted.

P. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

Q. Make provision for erection stresses. Provide temporary alignment and bracing. Touch-up field welds and scratched or damaged galvanizing with galvanizing repair paint.

R. Exterior Sheathing: Install sheathing vertically with end joints occurring over studs. Screw attach gypsum sheathing to exterior of each stud with fasteners and spacing as recommended by sheathing manufacturer.

1. At contractor's option, select from either of the following methods to seal joints.

a. Apply full bead of silicone sealant around each piece of sheathing and at perimeter of interface with other materials and trowel flat.

b. Apply fiberglass joint tape over sheathing joints, corners, and other perimeter of interface with other materials.

2. Apply membrane flashing horizontally to face of sheathing with upper sheets lapped over lower sheets. Lap vertical joints not less than 6 inches and horizontal joints not less than 5 inches.

   a. Coordinate with other flashing materials.

END OF SECTION

SECTION 06060

Lumber

PART 1 GENERAL

1.01 SECTION INCLUDES

A. the 2x4 lumber used for chords and webs in wood trusses.

1.02 RELATED SECTIONS

A. Section 06070 – Wood Treatments.

B. Section 6110 – Engineered Lumber.

C. Section 06170 – Wood Trusses

1.03 REFERENCES

A. Standard Grading Rules for Southern Pine Lumber as specified by the SPIB.

B. American Lumber Standard Committee

C. American Wood Preservers' Association (AWPA) Standards.

1. Recommended practices for preserving lumber

1.04 DELIVERY, STORAGE, AND HANDLING

A. All lumber in transit, storage, and handling areas should be protected from moisture, weather, and contaminants.

B. Coatings, wrappings, and coverings should allow circulation and not trap moisture.

1.05 ENVIRONMENTAL REQUIREMENTS

A. No Cold Weather Requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. 2x4x10' Dimensional Lumber, SPF, Grade 2.

1. Moisture content of a maximum 19% according to KD19.

2. Pressure treated according to building codes for wood trusses.

B. 2x4x# Dimensional Lumber, SPF, Grade 2.

1. Moisture content of a maximum 19% according to KD19.

2. Pressure treated according to building codes for wood trusses.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install chords and webs in conjunction with Section 6170

B. Make sure the chords and vertical webs are square

C. Cut the correct angle out for the webs inside of the chords and vertical webs

D. Fasten chords and webs together.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

B. Each piece of lumber should be an agency accredited by the American Lumber Standard Committee (ALSC), and manufactured in accordance with Product Standard PS 20-94 published by the U.S. Department of Commerce

END OF SECTION

SECTION 06090

FASTENERS - WOOD SCREWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Screws used for wood construction.

1.02 RELATED SECTIONS

A. Section 06060 – Lumber

B. Section 06090 – Nails.

1.03 REFERENCES

A. ANSI B18.6.1 – Wood Screws

1.04 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry

B. Store and protect products under provisions of Section 01600.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.

PART 2 PRODUCTS

2.01 MATERIALS

A. Screws: ASME B18.6.1, Phillips head screw.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pre-drill hole to a diameter and depth that does not exceed that of the screw.

A. Finish installation of screw with a power screwdriver, ensuring all screw heads are sank 1/16” below the surface of the wood.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rough carpentry as shown on the drawings, inferable therefrom and as specified.

1.02 RELATED SECTIONS

A. Section 06200- Finish Carpentry: Finish Carpentry includes the jobsite fabrication, finishing and installation of woodwork and related hardware and is limited to field painted opaque finishes.

B. Section 06400 – Architectural Woodwork: Architectural woodwork includes the shop fabrication, prefinishing and installation of woodwork and requires shop applied opaque and transparent finishes, plastic laminate and related hardware.

1.03 QUALITY ASSURANCE

A. Requirements and Regulatory Agencies:

1. Fire Retardant Treated Wood: Treat items required to be treated by Local Building Code and those items shown or specified as "Fire Retardant Wood."

B. Standards: All material and workmanship shall be in accordance with the latest issue of the applicable standards of the U.S. Department of Commerce, Voluntary Product Standards, PS, American Wood Preservers' Association, AWPA, and the applicable lumbermen's association rules under which each species of lumber is produced.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 06100.

B. Store and protect products under provisions of Section 06100.

C. Keep rough carpentry dry during delivery, storage, and installation. Provide air circulation in stacks of lumber and plywood.

1.05 PROJECT CONDITIONS

A. .Whenever rough carpentry is fitted to other work, obtain measurements of the other work verifying dimensions shown and shop details.

PART 2 PRODUCTS

2.01 MATERIALS

A. Lumber:

1. General Framing: 1200f, any species.

2. Nailers, Blocking: No. 1 Common; Douglas Fir, Southern Pine, or Cedar.

3. Lumber Grading: Comply with Product Standard PS20, "American Softwood Lumber Standards" and with applicable lumberman's association rules.

4. Grade Marking: Each piece of lumber shall be grade marked identifying mill and grading agency and signifying that lumber conforms to type, size, grade and seasoning provisions of the rules under which it was graded.

5. Sizes and Patterns: Provide lumber which is dressed S4S and worked to patterns shown or specified. Dimensions designate the nominal undressed size.

6. Moisture Content: Provide lumber which has been seasoned by air drying or kiln-drying to a moisture content not to exceed 19 percent.

B. Anchorages and Fasteners:

1. Bolts, Nuts, Studs, Rivets: FS FF-B-575, FF-S-1362 and FF-R-556.

2. Expansion Bolts: FS FF-S-325, group, type, class and style best suited for the purpose.

3. Lag screws and bolts: FS FF-B-561, type and grade best suited for the purpose.

4. Nails: FS FF-N-105, type and size best suited for the purpose. Hot dipped galvanized for exterior use.

5. Toggle Bolts: FS FF-B-588, type and class best suited for the purpose.

6. Wood Screws: FS FF-S-111, style best suited for the purpose. Hot dipped galvanized for exterior use.

7. Steel Plates and Shapes: ASTM A36, galvanized for exterior use.

8. Primer: Shop primer for ferrous metal, zinc chromate with a synthetic resin vehicle.

2.02 TREATMENT

A. Members embedded or in direct contact with concrete, masonry, plaster, fascia or spandrel members and every member, of which any part is exposed outside the exterior wall line.

B. Water-borne preservative materials as listed in FS TT-W-571, Table III for moderate leaching conditions which is not corrosive to metal and is paintable.

1. Osmose K-33, Osmose Wood Porducts, OSmose Wood Preserving, Inc.

2. Wolmanized, Hickson Corporation.

C. Pressure Treat in a closed retort by vacuum pressure process in compliance with FS TT-W-571.

2.03 FIRE RETARDANT TREATMENT

A. Fire retardant materials shall meet the requirements of the Local Building Code.

B. Pressure treat to meet Local Building Code requirements and AWPA Standard C20 for lumber as a minimum. Guarantee fire treated wood not to bleed through painted finish.

C. Size wood before treatment so that minimum cutting will be required after treatment.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Condition of Substrate: Examine the substrates and the conditions under which the work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.

3.02 ROUGH FRAMING

A. Frame to fit closely, and set accurately to required lines and levels. Secure rigidly in place in accordance with details and good practice.

B. Use shims of slate or steel for leveling wood members on concrete or masonry.

C. Cut and fit to accommodate other work as required and in a neat workmanlike manner.

D. Nail in accordance with national Forest Products Association publication “Manual for House Framing,” Table I- Recommended Nailing Schedule.

3.03 BLOCKING AND NAILERS

A. Provide blocking and nailers between framing members and masonry, concrete or steel as shown or required for fastening of sheathing, roofing, roof accessories, or attachment of fixtures, equipment, or other items.

END OF SECTION

SECTION 06160

ORIENTED STRAND BOARD – WEB MEMBERS

PART 1 GENERAL

1.01 RELATED SECTIONS

A. Section 06070 – Wood Treatments.

B. Section 06170 – Prefabricated Structural Wood

C. Section 06220 – Standard Pattern Wood Truss

1.02 REFERENCES

A. LP OSB Sheathing and Structural1 Sheathing DOC Voluntary Product Standard PS 2, Exposure 1,and Standard Structures Inc. quality control requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store panels in clean, dry areas off the ground. If possible, store indoors. If stored outside, cover with plastic sheets or tarps. Keep cover open and away from the sides and bottom of panels to allow for air circulation.

B. Additional protective measures may be necessary during extended adverse weather conditions.

C. OSB should not be used as siding or in other applications where it will be subject to prolonged exposure to moisture.

1.05 ENVIRONMENTAL IMPACT

A. Use of environmental control technology and energy efficient equipment to conserve resources.

B. Using process by-products to produce heat and electricity, thereby conserving nonrenewable energy sources.

C. Harvesting timberland following the soundest practices dictated by the ecological requirements of the specific type of forest.

PART 2 PRODUCTS

2.01 MATERIALS

A. OSB web members are manufactured to be free of knots, grain defects, splits and other irregularities. The wood strands are mixed with binder, arranged in layers for maximum strength and stability and bonded under heat and pressure.

B. OSB sheathing panels are of a consistent composition, easily handled, sound on both sides, and free of knots, core voids, splits and checks. They are coated on all four edges for added moisture resistance and dimensional stability.

2.02 PHYSICAL PROPERTIES

A. Uniquely suited to be adapted for new specialty applications requiring lighter weight, smoother surfaces, durability and moisture resistance.

PART 3 EXECUTION

3.01 INSTALLATION

A. Comply with local safety regulations when installing.

B. Comply with the following manufacturer's instructions and with APA's "Engineered Wood Construction Guide," Form No. E30R/Revised January 2001

C. Panels cut to size and used as reinforcement at joints of web members in wood floor truss.

3.02 LIMITATIONS

A. OSB SHEATHING PANELS ARE NOT FOR UNPROTECTED EXTERIOR USE; they must be covered with siding panels or other type of exterior wall cladding or roofing material. Normal exposure to weather during ordinary construction delays will not damage the panels. ADDITIONAL PROTECTIVE MEASURES ARE RECOMMENDED FOR EXTENDED ADVERSE WEATHER CONDITIONS.

B. Slight surface flaking or thickness swells caused by excessive rain or brief exposure to standing water will not affect the panels' structural performance.

END OF SECTION

SECTION 06420

WAINSCOT PANELING

PART 1 GENERAL

1.01 STIPULATIONS

A. The specifications sections “General Conditions”, “Special Requirements” and “General Requirements” form a part of this section by this reference thereto and shall have the same force and effect as if printed herewith in full.

1.02 RELATED SECTIONS

A. Section Includes:

1. Custom wood veneer paneling.

2. Wood trim and moldings.

3. Attachments.

B. Related Sections

1. Section 06100 – Rough Framing: Grounds and support framing.

2. Section 06200 – Finish Carpentry: Finish wood trim other than specified in this section.

3. Section 06402 – Architectural Woodwork.

4. Section 08800 – Glazing.

5. Section 09900 – Paints and Coatings.

1.03 REFERENCES

A. American Society for Testing and Materials:

1. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

B. Architectural Woodwork Institute:

1. AWI – Quality Standards Illustrated.

1.04 SUBMITTALS

A. Shop Drawings:

1. Indicate materials, surface graining elevations of sheet paneling, fastening methods, joining methods, and interruptions to other work.

2. Include plan of panel number sequencing.

B, Product Data: Submit data on fire retardant treatment.

C. Samples:

1. Submit two samples of each type and finish of paneling, 8x10 inch in size illustrating wood grain and specified finish.

2. Submit two samples of wood trim, 12 inch long, finished one face.

1.5 QUALITY REQUIREMENTS

A. Paneling: in accordance with AWI Architectural Woodwork Quality Standards, Custom quality.

1.6 QUALIFICATIONS

A. Fabricator: Company specializing in fabricating Products specified in this section with minimum five years documented experience; Certified by AWI Quality Certification Program.

1.7 MOCKUP

A. Construct a mockup of wood guard rail at lobby atrium space, approximately 6 feet long as indicated on the drawings, illustrating full panel sheet, edge trim, joint trim, applied finish. Incorporate work of the following sections and other sections required to illustrate components indicated on work drawings.

1. Wood trim specified in Section 06200

2. Metal Fabrications specified in Section 05500.

3. Metal Framing and gypsum board wall finish specified in Section 09260

B. Locate where directed by Professional.

C. Remove mockup when directed by Professional.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01040 – Coordination and Control: Product storage and handling requirements.

B. Protect work from Moisture Damage.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Comply with AWI requirements.

B. Maintain temperature and humidity conditions within design range for completed and occupied building.

C. Allow materials to acclimate to temperature and humidity conditions for minimum of 48 hours prior to installation. Maintain same conditions during and after installation.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 COORDINATION

A. Section 01040 – Coordination and Control: Coordination and project conditions.

B. Coordinate work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

C. Coordinate Locations and requirements for blocking and backing for support and attachment of work of this section.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Lumber: Graded in accordance with AWI Custom; maximum moisture content of 8 percent.

1. Lumber scheduled for Transparent Finish: Grade 1, white oak, quarter sawn.

B. Plywood: Graded in accordance with AWI Custom; MDF fire retardant core; with veneer face.

C. Veneer Face:

1. Natural Wood Veneer: AWI grade AA veneer, white oak, quarter sawn.

2. Color Stained Wood Veneer: Natural wood, color dyed; wood species and color as selected by Professional.

a. Ventec Ltd.

b. Herzog Veneers.

c. Wood River Veneer.

d. Crown Hardwood veneer.

D. Panel Matching:

1. Between Leaves:

    a. Dyed Woods: Book Match

    b. Oak: Slip Match

2. Within Panel Face: Center Balance.

3. Between Panels: Sequence matched sets.

2.2 ACCESSORIES

A. Adhesive: Type recommended by AWI

B. Panel Fasteners: Concealed, Z-clips, galvanized steel.

C. Trim Fasteners: Galvanized steel to suit application.

D. Lumber for Shimming and Blocking: As specified in Section 06100

E. Primer: As specified in Section 09900

F. Wood Filler: Tinted to match surface finish color.

2.3 WOOD TREATMENT.

A. Manufacturers:

1. Hickson Corporation; Dricon fire retardant treated wood.

2. Hoover Treated Wood Products Inc.; Pyro-Guard fire retardant treated wood.

3. Chemical Specialties Inc.; D-Blaze FRT

B. Fire Retardant Treatment: Pressure treatment, AWPA C20 for lumber and AWPA C27 for plywood, Interior Type, chemically treated and pressure impregnated; capable of providing a maximum flame spread / smoke development rating of 75/450.

1. Shop pressure treat wood materials that do not meet fire retardant requirements, naturally.

2. Provide indentification on fire retardant treated material.

3. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

4. Kiln dry wood after pressure treatment to maximum 10 percent moisture content.

2.4 FABRICATION

A. Fabricate to AWI Custom standards to design indicated on Drawings.

B. Shop prepare and identify sheets for grain matching during site erection.

C. Prepare Panels for delivery to site, permitting passage through building openings.

D. Fit exposed sheet material edges with veneer edging to match face veneer. Use one piece for full length only.

E. When necessary to cut and fit on site, fabricate materials with ample allowance for cutting.

F. Fabricate trim indicated on Drawings to sizes required for installation. Factory miter and joints and machine for biscuit jointing to suit application.

2.5 SHOP FINISHING

A. Finish work in accordance with AWI – Section 1500, color and sheen as selected.

1. Transparent Finish: System TR-6 catalyzed polyurethane, color and sheen as selected.

B. Seal surfaces in contact with cementitious materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.2 INSTALLATION

A. Install work in accordance with AWI Custom Quality Standard.

B. Set and secure materials and components in place, plumb and level.

C. Scribe work abutting other components to AWI tolerances. Do not use additional overlay trim to conceal larger gaps.

D. Coordinate Installation of blocking behind panelling.

E. Install paneling with Z clips.

F. Install paneling plumg and level with flush surface in single plane.

G. Trim paneling with lumber trim as indicated on Drawings.

3.3 ERECTION TOLERANCES

A. Maximum Variation from Indicated Position: 1/16 inch.

B. Maximum Offset from Alignment with Abutting Materials: 1/32 inch.

END OF SECTION.

SECTION 07210

BUILDING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. 1” Exterior Insulation secured to CMU.

1.02 RELATED SECTIONS

A. Section 04200 – Unit Masonry: Insulation for Unit Masonry.

B. Section 07200 – Thermal Protection: Adhesive for Insulation.

1.03 REFERENCES

A. ASTM C578 – Rigid Cellular Polystyrene Thermal Insulation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 PRODUCTS

2.01 MATERIALS

A. ASTM C578 – Rigid Cellular Polystyrene Thermal Insulation

B. Insulation/CMU adhesive, Section 07200

PART 3 EXECUTION

3.01 INSTALLATION

A. On masonry walls, after damp proofing is applied, install units of plastic insulation, with small pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face, as recommended by manufacturer. Fit courses of insulation between wall ties and other confining obstructions, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

B. Fill cracks and open joints in insulation with crack sealer compatible with insulation and masonry. Construction tape may also be used to seal cracks and joints.

3.02 PROTECTION

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.03 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 07230

BUILDING INSULATION

PART 1 – GENERAL

1.01 SECTION INCULDES

A. Plastic board building insulation
   1. Extruded polystyrene

B. Glass fiber building insulation
   1. Foil-faced blankets
   2. Sound control blankets

C. Accessories for building insulation including (but not limited to):
   1. Adhesive bonding insulation
   2. Mechanical anchors
   3. Vapor retarders

1.02 RELATED SECTIONS

A. SECTION 07240 – Exterior Insulation and Finish Systems: Insulation integral to system

B. SECTION 07530 – Elastic Sheet Roofing: Roof insulation

C. Division 15: Insulation for Heating Work components

D. Division 17: Insulation for Plumbing Work components

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM C 578 – “Specification for Preformed, Cellular Polystrene Thermal Insulation”

2. ASTM C 665 – “Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing”

3. ASTM E84 – “Test Method for Surface Burning Characteristics of Building Materials”

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. Storage: Store insulation delivered to Site off ground or floor slab and fully protected from damage, weather, and ground water at all times.

2. Protection from Deterioration: Do not allow insulation materials to become wet of soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation. Protect plastic insulation from exposure to sun light.

3. Fire Hazard Protection: Do not deliver plastic insulation materials to Site ahead of time of installation. Protect at all times against ignition. Complete installation and concealment of plastic materials as rapidly as possible in each area.

PART 2 – PRODUCTS

2.01 GLASS FIBER BUILDING INSULATION

A. Foil-Faced Blankets (Batts): Glass fiber and resinous binders formed into flexible blankets with aluminum foil facing laminated to one side with stapling flanges on long edges; comply with requirements of ASTM C 665 for Type III insulation and following:

1. Thermal resistance:
   a. 6-1/4-inch thickness: R-19
   b. 3-1/2-inch thickness: R-11
2. Vapor transmission: 0.5 perm or less.
3. Flame spread (ASTM E84): less than 75
4. UL listed.

B. Sound Control Blankets: Glass fiber and resinous binders formed into un-faced flexible blankets; complying with requirements of ASTM C 665 for Type I insulation and following:

1. Flame spread (ASTM E84): less than 75
2. UL listed.

2.02 ACCESSORIES

A. Adhesive for Bonding Insulation: Type recommended by insulation manufacturer and complying with fire-resistance requirements

B. Mechanical Anchors: Type and size shown or, if not shown, as recommended by insulation manufacturer for type of application shown and conditions of substrate,

C. Vapor Retarders:

1. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils thick, with maximum permeance of 0.13 perm.

2. Reinforced-Polyethylene Vapor Retarders: 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than 25 lb/1000 sq. ft., with maximum permeance rating of 0.0507 perm.

3. Fire-Retardent, Reinforced-Polyethylene Vapor Retarders: 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either a non-woven grid of nylon or polyester scrim and weighing not less than 22 lb/1000 sq. ft., with maximum permeance rating of 0.1317 perm, and flame-spread and smoke-developed indices of not more than 5 and 60, respectively.

4. Foil-Polyester Film Vapor Retarder: 2 layers of 0.5-mil-thick polyester film laminated to an inner layer of 1-mil-thick aluminum foil, with maximum water-vapor transmission rate in flat condition of 0.0 g/h x sq. m and with maximum flame-spread and smoke-developed indices of 5.

5. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 – EXECUTION

3.01 PREPARATION

A. Clean substrates of substances harmful to insulation of vapor barriers, including removal of projections that night puncture vapor barriers.

B. Close off openings in cavities to receive poured-in-place loose fill insulation sufficiently to prevent escape of insulation.

3.02 INSTALLATION

A. Extend insulation full thickness as shown over entire surface to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation and mastic.

B. Apply single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

C. Set vapor barrier faced units with vapor barrier to inside of construction, except as otherwise shown. Do not obstruct ventilation spaces.

   1. When blanket insulation is installed over ceiling in attic space, provide adequate ventilation of attic space to prevent condensation on top of insulation.

D. Tape joints and ruptures in vapor barriers, using adhesive tape of type recommended by insulation manufacturer, and seal each continuous area of insulation to surrounding construction so as to ensure vapor tight installation of units.

3.03 PROTECTION

A. Protect installed insulation and vapor barrier from harmful exposure and physical abuse until coverage by permanent concealing work. Advise Prime Contractor of exposure hazards, including possible sources of deterioration and fire hazard.

END OF SECTION

SECTION 07651

FLEXIBLE COPPER SHEET FLASHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete flashing system for single wythe C.M.U. construction.

1.02 RELATED SECTIONS

A. Section 04800 – Masonry Assemblies: Installation of copper flashings as part of masonry wall construction.

B. Section 07320 – Roof Tiles: Installation of copper flashing as part of clay roof tile installation.

1.03 REFERENCES

A. ASTM B370 – Copper Sheet and Strip for Building Construction.

B. ASTM D2822 – Asphalt Roof Cement.

C. ASTM E154 – Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, or Walls, or as Ground Cover.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Section 01330 – Submittal Procedures:

1. Product data and installation instructions.

2. [2 by 2] [51 by 51 mm] minimum sample of copper flashing(s).

1.05 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC requirements.

B. Maintain materials and surrounding air temperature to minimum 10 degrees C (40 degrees F) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Normal – Type I, white color for facebrick and grey color for common brick

B. Mortar aggregate: ASTM C144, standard masonry type; clean dry; protected from dampness, freezing, or foreign matter.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and potable.

E. Mortar Color: Mineral oxide pigment; chocolate brown color; “Great Stuff” manufactured by Acme Manufacturing Co. Ltd.

2.02 MIXES

A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using proportion method.

B. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270, Type N, using proportion method.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color in accordance with manufacturer’s instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install mortar in conjunction with Sections 04200 and 04450.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

END OF SECTION

SECTION 07651

FLEXIBLE COPPER SHEET FLASHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete flashing system for single wythe C.M.U. construction.

1.02 RELATED SECTIONS

A. Section 04800 – Masonry Assemblies: Installation of copper flashings as part of masonry wall construction.

B. Section 07320 – Roof Tiles: Installation of copper flashing as part of clay roof tile installation.

1.03 REFERENCES

A. ASTM B370 – Copper Sheet and Strip for Building Construction.

B. ASTM D2822 – Asphalt Roof Cement.

C. ASTM E154 – Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, or Walls, or as Ground Cover.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Section 01330 – Submittal Procedures:

1. Product data and installation instructions.

2. [2 by 2] [51 by 51 mm] minimum sample of copper flashing(s).

2.01 MATERIALS

A. Sheet copper flashing:

1. Type: 5 layers, flexible flashing consisting of copper sheet bonded on both sides to asphalt coated glass fabric; Advanced Copper Fabric as manufactured by Advanced Building Products, Inc.

2. Characteristics: Waterproof, flexible, high tensile strength, resistant to mortar acid and alkali action, allowing minimum thermal cold flow through structure, and textured surface promoting mortar joint bonding.

3. Copper sheet: Full, single copper sheet weighing [2] [3] [5] [7] ounces per square foot and complying with ASTM B370.

4. Coating: Asphalt bonded to copper and covered with coarsely woven, heavy glass fabric reinforcing.

5. Roll width: [36 inches,] [914 mm]

B. Sheet copper flashing:

1. Type: 3 layers, flexible flashing consisting of copper sheet coated on both sides to plasticized asphalt compound; Cop-R-Cote as manufactured by Advanced Building Products, Inc.

2. Characteristics: Waterproof, flexible at extreme temperatures, high tensile strength, resistant to mortar acid and alkali action, self-sealing at punctures and allowing minimum thermal cold flow through structure.

3. Copper sheet: Full, single copper sheet weighing [2] [3] [5] [7] ounces copper per square foot and complying with ASTM B370.

4. Coating: Plasticized asphalt compound weighing 6 ounces per square foot minimum.

5. Roll Width: [36 inches,] [914 mm]

C. Sheet copper flashing:

1. Type: 3 layers, flexible flashing consisting of copper sheet bonded on one side by asphalt to waterproof, creped, kraft paper; Cop-R-Kraft Flashing as manufactured by Advanced Building Products, Inc.

2. Characteristics: Waterproof, flexible, high tensile strength, chemical resistant, and allowing minimum thermal cold flow through structure. Suitable for frame construction. Not recommended for masonry joint flashings.

3. Copper sheet: Full, single copper sheet weighing [1] [2] [3] ounces per square foot and complying with ASTM B370.

4. Coating: Heavy, waterproof, creped, kraft paper [reinforced with heavy fibers,] and bonded to copper with asphalt.

5. Roll width: [36 inches] [914 mm]

D. Sheet copper flashing:

1. Type: 5 layers, flexible flashing consisting of copper sheet bonded on both sides by asphalt to waterproof, creped, kraft paper; Cop-R-Kraft Duplex Flashing as manufactured by Advanced Building Products, Inc.

2. Characteristics: Waterproof, flexible, high tensile strength, resistant to mortar acid and alkali action, allowing minimum thermal cold flow through structure, and rough textured surface promoting mortar join bonding.

3. Copper sheet: Full, single copper sheet weighing [1] [2] [3] [5] ounces per square foot and complying with ASTM B370.

4. Coating: Heavy waterproof, creped, kraft paper [reinforced with heavy fibers] and bonded to copper with asphalt.

5. Roll width: [36 inches] [914 mm]

E. Copper and lead flashing:

1. Type: 3 layers, flexible flashing consisting of single bi-metal sheet of lead and copper bonded on one side by asphalt to waterproof, creped, kraft paper; Cop-R-Kraft Plus Lead Flashing as manufactured by Advanced Building Products, Inc.

2. Characteristics: Waterproof, flexible, high tensile strength, chemical resistant, and allowing minimum thermal cold flow through structure. Suitable for frame construction. Not recommended for masonry joint flashings.

3. Core Sheet: Single copper and lead sheet and weighing [2] [3] ounces per square foot and complying with ASTM B101.

4. Coating: Heavy, waterproof, creped, kraft paper reinforced with heavy fibers, and bonded to core with asphalt.

5. Roll width: [36 inches] [914 mm]

F. Sheet copper and lead finishing:

1. Type: 5 layers, flexible flashing consisting of bi-metal sheet of lead and copper bonded on both sides by asphalt to waterproof, creped, kraft paper; Cop-R-Kraft Duplex Plus Lead Finishing as manufactured by Advanced Building Products, Inc.

2. Characteristics: Waterproof, flexible, high tensile strength, resistant to mortar acid and alkali action, allowing minimum thermal cold flow through structure, and rough textured surface promoting mortar joint bonding.

3. Core Sheet: single sheet of lead and copper weighing [2] [3] [5] [7] ounces per square foot and complying with ASTM B101.

4. Coating: Heavy, waterproof, creped, kraft paper reinforced with heavy fibers, and bonded to core with asphalt.

5. Roll width: [36 inches] [914 mm]

G. Flashing mastic: Fibrated, trowel grade mastic consisting of asphalt, mineral stabilizers, and interfibe complying with ASTM D2822, Type 1; Cop-R-Tite Flashing as manufactured by Advanced Building Products, Inc.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of flashings with erection of masonry walls to ensure material is provided in timely manner for embedment in mortar joints.

B. Inspection: Verify masonry surfaces to receive through-wall flashings are smooth, free of loose materials, and properly sloped to provide drainage.

C. Verify that adequate weep holes and mortar deflection devices are being installed to provide proper drainage at flashing locations.

D. Coordinate installation of flashings with installation of clay roof tiles to ensure material is provided in timely manner for attachment to roof substrate.

3.02 INSTALLATION

A. Install flashings in accordance with Drawings, approved shop drawings, and manufacturer's recommended installation instructions.

B. Install copper flashings at all [foundation sills] [window and door sills and heads] [spandrels] [parapets] [through-wall conditions] and other locations as detailed on Drawings.

C. Masonry applications:

1. Horizontal masonry joint flashing: Lay in slurry of fresh mortar and top with full mortar bed. Continue flashing through wall. Leave exposed at exterior for inspection. After inspection, cut flush with masonry surface.

2. Vertical masonry surfaces: Spot surface with mastic to hold in place until masonry is set. Secure flashing in back wall mortar joint or reglet.

3. Foundation sill flashing: Lay in slurry of fresh mortar and top with full mortar bed. Leave flashing flush with exterior masonry surface.

   a. On inside turn up flashing [2 inches] [51 mm] minimum or continue flashing upward across cavity [6 inches] [152 mm] minimum and secure in back wall mortar joint or reglet.

   b. At sill and column intersections, extend flashing up column [10 inches] [254 mm] and secure with mastic and termination bar.

4. Cavity wall flashing: Lay in slurry of fresh mortar and top with full mortar bed. Leave flashing flush with exterior masonry surface. Continue flashing upward across cavity [6 inches] [152 mm] minimum and secure in back wall mortar joint or reglet.

5. Spandrel flashing: Start flashing at shelf angle toe, continue up beam, turn through wall, and turn up [2 inches] [51 mm] minimum on inside.

pierced by anchor bolts, seal with mastic.

2. Head flashing: Extend [4 inches] [102 mm] above trim and behind sheathing or sheathing paper. Turn flashing down over drip cap edge. Extend flashing [6 inches] [152 mm] beyond each side of opening.

3. Sill flashing: Secure to back of wood sill. Carry downward over sheathing and secure to sill plate. Carry beyond opening and form pan by folding. Do not cut.

E. Vapor barrier under floors: Ensure substrate is dry, smooth, and free of loose material. Use maximum width material. Lay barrier material with metal face down in coating of mastic. Butt joints. Roll from center to edge with 50 to 100 pounds roller. Remove excess mastic.

F. Lap joints: Coat contacting surfaces with mastic and lap [4 inches] [102 mm] minimum. Roll with hand roller until mastic bead appears at edges.

6. Parapet and coping flashings: Lay in slurry of fresh mortar and top with full mortar bed. Leave flashing flush with exterior and interior masonry surfaces.

7. Head and sill flashings: Start flashing flush with exterior wall surface or lintel and continue through or up wall. Extend flashing [6 inches] [152 mm] on each side of opening and turn up forming pan. Fold corners; do not cut.

D. Frame construction applications:

1. Sill flashings and termite guards: Lay flashing in coating of mastic with metal face down. Extend [2 inches] [51 mm] on both side of foundation wall. Where

3.03 FIELD QUALITY CONTROL

A. After installation of flashings [and completion of masonry assemblies], inspect work.

1. Verify flashings have been properly installed at all required locations to prevent water penetration.

2. Verify weep holes have been provided to ensure proper drainage to exterior.

B. Water test flashings at [minimum of [3] locations] [locations designated by Architect] to verify flashing has been properly installed and moisture drains through weep holes.

C. Trim exposed flashings flush with masonry surface.

END OF SECTION

SECTION 08110

HOLLOW METAL DOORS and FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

1. Hollow Metal Doors

a. Interior-exterior

b. Single and double doors

c. Provisions for fixed glass and glazing

d. Louvers and undercuts as required or noted.

e. Fire and non-fire rated.

2. Hollow Metal Frames

a. Interior-exterior.

b. Frames for wood doors.

c. Jamb Anchors, floor knees and temporary and temporary spreaders.

d. Fire and non-fire rated.

3. Reinforcing and cutouts for hardware.

4. Shop applied baked-on prime coats.

5. Conformance to Code Compliance

a. Overlapping astragals for pairs of fire rated doors.

1.02 RELATED SECTIONS

A. Section 03300 – Cast-in-place concrete

B. Section 04220 – Concrete block masonry

C. Section 04420 – Exterior stonework

D. Section 05500 – Metal work – loose lintels.

E. Section 06200 – Finish Carpentry – receive, store and installation of hollow metal.

F. Section 07900 – Joint sealers.

G. Section 08200 – Flush wood doors.

H. Section 08305 – Access doors

I. Section 08420 – Aluminum and glass doors

J. Section 08700 – Finish hardware, weatherstripping, saddles and thresholds

K. Section 08800 – Glass and Glazing

L. Section 09250 – Gypsum drywall.

M. Section 09900 – Painting.

1.03 REFERENCES

1. Steel Door Institute (SDI)

ANSI/SDI-100 Recommended Specifications Standard Steel Doors & Frames

ANSI/SDI-117 Manufacturing Tolerances Standard Steel Doors and Frames

2. Underwriters Laboratories (UL)

Building Materials Directory

3. American Society for Testing and Materials (ASTM)

ASTM A36 Structural Steel

ASTM A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A366 Sheet Steel Carbon; Cold Rolled Commercial Quality

ASTM A525 Sheet Steel Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality

ASTM A569 Specifications for Steel, Carbon (0.15 maximum percent), Hot-rolled Sheet and Strip, Commercial Quality

ASTM C236 Test – Thermal Performance by Guarded Hot Box

ASTM C509 Cellular Elastromeric Performed Gaskets and Sealing Materials

ASTM E152 Methods for Fire Tests of Door Assemblies

4. National Fire Protection Association (NFPA)

NFPA 80 Fire Doors and Windows

NFPA 10 Life Safety Code

NFPA 105 Recommended Practice for Installation of Smoke Control Door Assemblies

NFPA 252 Standard Method of Fire Test of Door Assemblies

5. Builders Hardware Manufacturers Association (BHMA)

6. Factor Mutual

Class No. 4100 Fire Door and Frame Assemblies

7. American National Standards Institute (ANSI)

ANSI/DHI A115 Steel Door and Frame Preparation

ANSI/DHI A115.IG Installation Guide for Doors & Hardware

ANSI A123.1 Door Terminology

ANSI A151.1 Test Procedure for Physical Endurance for Doors & Hardware

ANSI A224.1 Test Procedure & Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors & Frames

8. Warnock Hersey Professional Services Ltd. (WHI)

9. Steel Structures Painting Council (SSPC)

SSPC PT-2 Cold Phosphate Surface Treatment

SSPC PT-4 Hot Phosphate Surface Treatment

SSPC SP No. 12 Bituminous Coating

10. Insulated Steel Door Systems Institute (ISDSI)

1.04 SUBMITTALS

A. The Certificates listed below are required to be submitted by the Contractor to the Architect, for review. An omission of an item or items does not relieve the Contractor fro this responsibility, and for compliance with the Contract Documents, of which this is a part.

NOTORIZED CERTIFICATES OF COMPLIANCE

Item No.	Description	Standard
C1	Label Requirements	UL/NFPA/WHI
C2	Metal Sheets	ASTM A366, A568
C3	Steel Reinforcement	ASTM A36 & ASTM A569
C4	Shop Paint	As specified and VOC –compliant
C5	Galvanizing	ASTM A526/A525 G90
C6	Fasteners, supports	ASTM A153

B. Shop Drawings

1. Submit shop drawings for review in accordance with the requirements of the Contract Documents.

2. Shop drawings shall indicate at large scale, profiles, gauges, sizes, reinforcing and anchorage devices for securing to adjacent materials.

3. Include schedules, listing the quantities of each kind and type of buck, frame, trim and door, size of doors and frames, clearances, louvers, undercuts, location and label requirements.

    a. Provide details of doors which have provisions for glass lights and sidelights.

    b. Provide fixed astragals for pairs of fire rated doors.

4. The Architect's scheduled numbers shall be referenced and noted on the schedules submitted for review.

5. Clearly indicate the work to be provided by other trades and coordinate accordingly.

C. Submit manufacturer's product data and test data for each fire rated door and frame construction.

D. Manufacturer's certificate starting that each assembly required to be fire rated but exceeding sizes of tested assemblies has been constructed to conform to design, materials and details of construction equivalent to requirements for labeled units.

1.05 DELIVERY, STORAGE & HANDLING

A. Deliver hollow metal work to the job site so as to cause no delay in the progress of the work and adequately protect from damage during delivery and storage at the site. Provide packaging, separators, banding and spreaders to protect the hollow metal work while in transit, storage and movement.

B. Store doors and frames upright in a protected dry area, at least 4" or more off the ground or floor and at least ¼" between individual components to promote circulation, and until ready for installation.

1. Place units on a minimum 4-inch-high wood block. Avoid the use of non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become went, remove cartons immediately.

C. Delivered materials which are damaged or otherwise not suitable for installation shall be removed from the job site and replaced with acceptable materials. Tools marks, rust, blemishes or any other damage on exposed surface will not be acceptable.

D. Label or mark doors and frames and identity as to room and floor number to expedite instillation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Metal shall be best quality American Open Hearth sheet metal furniture, stock , cold rolled, full pickled, annealed stretcher leveled and free from scale, blisters, pits and other defects, conforming to ASTM A366 for door and hot rolled prime quality carbon steel for frames and picked steel conforming to ASTM A569.

B. Steel reinforcements, supports bracing and sub-framing shall conform to ASTM A36. Commercial grade hot rolled and pickled steel shall conform to ASTM A569

C. Galvanized steel sheets for exterior doors and frames: Zinc-coated carbons steel sheets of commercial quality, complying with ASTM A-526 and ASTM A525, A526 or A527 with A60 or G60 coating designation mill phosphatized.

D. Insulating material for hollow metal doors shall be mineral fiberboard for interior doors and polyurethane for exterior doors, resistant to fire, moisture, vermin, mildew and rot to meet requirements of this section. Provide cores for labeled doors.

E. Shop coat treatments shall consist of a phosphate coating and cleaning and a finish coating consisting of a rust inhibitive VOC compliant primer, conforming to ANSI A224.1 Shop coats shall be compatible with finish painting specified under Section 09900.

1. Surfaces concealed in masonry shall conform to SSPC12, bituminous type.

F. Supports and anchors: Fabricate of not less than 16 gauge sheet metal. Galvanize after fabrication units to be built into exterior walls complying with ASTM A153, Class B.

G. Inserts, bolts and fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM 153, Class C or D as applicable.

H. Gauges for hollow metal work shall be U.S. Standard. The following are gauges to be used on this project:

Item	Gauge
1.	Exterior doors.....16
2.	Exterior door frames….....14
3.	Interior doors……..18
4.	Interior door frames and sidelights for openings up to 4'-0" wide……...16
5.	Removable glass stops…….....16
6.	Adjustable jamb anchors……18
7.	Floor knees…….11
8.	Structural Reinforcing……10
9.	Stirrups for adjustable anchors…….....14

10. Hardware reinforcement:

a. Hinges, butts……3/16” plates or 7 gauge x 1-1/2” wide by 6” longer than hinge secured by not less than 6 spot welds.

b. Lock face, flush bolts, closers and concealed holders, panic devices……...….12

c. For surface mounted hardware and all other hardware…..…….....16

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2.04 Hollow Metal Frames

A. Hollow metal frames shall be custom made welded units integral trim, conforming to gauges, sizes and profiles noted, complete with cutouts and reinforcing in accordance with reviewed shop drawings.

B. Head and jamb members of each frame shall be carefully mitered together with contact edges tightly closed and trim aligned to fit straight true and level. Weld corner joints together accurately with welds on exposed surfaces ground smooth and flush and rendered inconspicuous.

C. Finished work shall be strong, rigid, neat in appearance, and free from defects. Moulded members shall be clean cut, straight and of uniform profile.

D. Knock down type frames or welded knock down frames will not be accepted.

E. Form frame member to provide mitered trim and butted stops. Join head and jamb members by continuous welds occupying the full dept and width of the frame.

F. Provide 11 gauge floor knees, consisting of clip angles welded to plates, welded to bottom of door jambs. Fasten knees to slab with two (2) 3/8” bolts.

G. Floor anchors: Provide floor anchors for each jamb and mullion that extends to floor, formed of not less than 14 gauge galvanized steel sheet as follows:

1. monolithic concrete slabs: clip-type anchors, with 2 holes to receive fasteners, welded to bottom of jabs and mullions.

2. Separate topping concrete slabs: Adjustable type with extension clips, allowing not less than 2inch height adjustment. Terminate bottom of frames at finish floor surface.

H. Head anchors: Provide 2 anchors fat head of frames exceed 42 inches wide for frames mounted in steel stud walls

I. Head Strut supports: Provide 3/8 inch by 2 inch vertical steel struts extending from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members in compliance with UL 63.

J. Structural reinforcing members: Provide as part of frame assembly, where indicate at mullions , transoms, or other locations that are to be built into frame.

K. Rubber door silencers: Except on weatherstripped doors, drill stop in strike jamb to receive 3 silencers on single-door frames and drill head jamb stop to receive 4 silencers on double door frames. Install plastic plugs to keep holes clear during construction.

2.05 Hollow Metal Doors

A. Hollow metal doors shall be made, full welded lock seam, conforming to types , sizes and profiles noted, 1-3/4” thick unless otherwise noted, complete with cutouts and reinforcing in accordance with the reviewed submittals.

1. Interior doors: ANSI/SDI-100, Grade II, heavy duty Model 3 or 4.

2. Exterior door: ANSI/SDI-100, Grade III, heavy duty Model 4.

B. Doors Shall be flush type, constructed of two (2) outer cold rolled stretcher leveled sheet steel, assembled and reinforced with 18-gauge hat or truss section vertical stiffeners, spaced 6” o.c., extending the full heights of the door and spot welded to both door plates not more than 4” o.c. Close tops and bottoms of doors with continuous 16-gauge steel channels spot welded to both faces at not over 3” o.c Return the outer vertical edges of sheet at edges to a close and accurate fit. Fill spaces between vertical stiffeners completely with the approved type insulation to eliminate "metallic ring".

1. Spot weld door edges 6” o.c. and fill remained or joint with metallic fill and grind smooth and flush.

2. Weld exposed joints continuously; grind, fill, dress and make smooth, flush and invisible.

3. Edge profiles shall be provided on both vertical edges of doors as follows:

a. Single acting doors – beveled 1/8” in 2”.

b. Double acting doors – rounded on 2-1/8” radius.

4. Top channel of exterior doors to be inverted and full welded to both faces.

2.07 SHOP APPLIED PRIME COATS

A. After fabrication, all tool marks and surface imperfections shall be dressed clean by grinding, filling and sanding as required to make all surfaces smooth, level and free of irregularities.

B. Surfaces shall be free of dust, grease, oil or foreign substances prior to the application of the shop coats.

C. Shop painting shall consist of the following:

1. Apply pretreatment to cleaned metal surfaces using cold phosphate solution (SSPC-PT2).

2. Baked-on rust inhibitive prime coat 1.5 mils dft, suitable as a base for specified finish paints complying with ANSI A224.1.

3. Second coat on concealed surfaces shall consist of coating metal surface sin contact with masonry and/or concrete with approved bitumastic paint.

4. Shop prime ferrous sub-framing, accessories and anchors and touch up with same paint in field as required.

5. Shop paint shall be VOC compliant.

PART 3 EXECUTION

3.01 INSTALLTION OF HOLLOW METAL WORK

A. Install work using skilled workers thoroughly experienced in installation of hollow metal work.

B. Set frames plumb and level at proper locations, align and brace securely until permanent anchors are fixed. Anchor bottom of frames to floor with expansion bolts after adjustments are made. Where required to properly brace frames, provide additional struts anchored to rough ceiling construction above.

C. Wire brush and touch up with same primer as shop coat areas of doors and frames which become abraded, scratched or show signs of rusts.

D. Dimple in and fill exposed fasteners with metallic filler and finish flush with adjoining surfaces and prime ready for painting.

E. Hang doors accurately on hardware with clearances as follows:

1. Jambs……3/32 inch

2. Head……..1/8 inch

3. Sill…….3/16 inch above finished floor or saddle unless doors are undercut.

3.02 ADJUST AND CLEAN

a. Final adjustments: Check and readjust operating hardware items just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work including doors or frames are warped, bowed or otherwise unacceptable.

B. Prime coat touch-up: Immediately after reaction, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air drying primer.

END OF SECTION.

1. GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this section.

1.2 SUMMARY

A. This Section includes steel doors and frames.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 4 Section “Unit Masonry” for building anchors into grouting frames in masonry construction.
2. Division 8 Section “Flush Wood Doors” for hollow-core and solid-core wood doors installed in steel frames.
3. Division 8 Section “Finish Hardware” for door hardware and weather-stripping
4. Division 8 Section “Glazing” for glass in steel doors.
5. Division 9 Section “Gypsum Board Assemblies” for spot grouting frames in gypsum board partitions.
6. Division 9 Section “Painting” for field painting primed doors and frames.

1.3 SUBMITTALS

A. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

B. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions of openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

C. Door Schedule: Submit schedule of doors and frames using reference numbers for details and openings as those on Contract Drawings.

1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

D. Samples for verification of each type of exposed finish required, prepared on Samples not less than 3 by 5 inches (75 by 125 mm) and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

E. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies provide certification by a testing agency acceptable to authorities having jurisdiction that doors conform to all standard construction requirements of tested and labeled fire-rated door assemblies except for size.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames card-board wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory finished doors and frames.

B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using nonvented plastic or canvas shelters that could create humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum ¼ -inch- (6-mm-) spaces between stacked doors to promote air circulation.

2. PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:

1. Steel Doors and Frames:
   a. Amweld Building Products, Inc.
   b. Ceco Door Products
   c. Curries Co.
   d. Republic Builders Products
   e. Steelcraft.

2.2 MATERIALS

A. Hot Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM569 (ASTM 569M).

B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.

C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526 (ASTM A526M), commercial quality, or ASTM A 642 (ASTM A 642M), drawing quality, hot dip galvanized according to ASTM

A 525 , with A 60 or G 60 (ASTM A 525M, with Z180 or ZF 180) coating designations, mill phosphatized.

D. Supports and Anchors: Fabricated from not less than .0478-inch- (1.2-mm-) thick (18 gage) steel sheet; .0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.3 DOORS

A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules.

1. Interior Doors: Grade II, heavy-duty, Model 1, full finish design, minimum .0478-inch-(1.2-mm-) thick (18 gage) cold-rolled steel sheet faces for doors up to 3 ft. wide. 16 gage for doors over 3 ft. wide.
2. Exterior Doors: Grade III, extra heavy-duty, Model 1, full finish design, minimum .0635-inch- (1.6-mm-) thick (16 gage) galvanized steel sheet faces.

B. Door Louvers: Provide louvers according to SDI 111C for interior Doors where indicated, with blades or baffles formed of .0239-inch- (.6-mm-) thick (24 gage) cold-rolled steel sheet set into minimum .0359-inch-(.9-mm-) thick (20 gage) steel frame.

1. Sight-Proof Louvers: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.

2.4 FRAMES

A. Provide metal frames for doors, transoms, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and Schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum .0598-inch- thick (16gage) cold rolled steel sheet.

1. Fabricate frames with mitered or coped and continuously welded corners.
2. Fabricate exterior frames from .0635-inch- (14 gage) thick galvanized steel sheet.
3. Drip Caps: 14-gage steel, for exterior frames at out-swinging doors.

B. Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

C. Plaster Guards: Provide minimum .0179-inch- (.45-mm-) thick (26 gage) steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

D. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry".

2.5 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI 100 requirements.

1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
    a. Resin-impregnated paper honeycomb.
    b. Rigid polyurethane conforming to ASTM C 591.
    c. Rigid mineral fiber with internal sound deadener on inside of face sheets.
2. Clearances: Not more than 1/8 inch (3.2mm) at jambs and heads, except not more than ¼ inch (6.4 mm) between non-fire-rated pairs of doors. Not more than ¾-inch- (19 mm) at bottom.
    a. Fire Doors: Provide clearances according to NFPA 80.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.

C. tolerances: Comply with SDI117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, ad moldings from either cold- or hot-rolled steel sheet.

E. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI112. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum .0635-inch-(1.6-mm-) this galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.

1. At exterior locations and where indicated.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Thermal_Rated (insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.

1. Unless otherwise indicated, provide thermal-rated assemblies with U-Value rating of .41BTU/sq. ft. x h x deg F (2.33W/sq.m x K) or better.

H. Sound-Rated (Acoustical) Assemblies: Where shown or scheduled, provide door and frame assemblies fabricated as sound reducing type, tested according to ASTM E 1408, and classified according to ASTM E 413.

1. Unless otherwise indicated, provide acoustical assemblies with STC sound ratings of 33 or better.

I. Hardware Preperation: Perpare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and

templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.

J. Reinforce doors and frames to receive surface applied hardware. Drilling and tapping for surface applied hardware may be done at project site.

K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

L. Glazing Stops: Minimum .0359-inch-(.9-mm-) thick (20 gage) steel or .040-inch- (1-mm-) thick aluminum.

1. Provide non-removable stops on outside of exterior doors and secure side of interior doors for glass, louvers, and other panels in doors.
2. Provide screw applied removable, glazing beads on inside of glass, louvers, and other panels in doors.

2.6 FINISHES

A. Comply with NAAMM's "Metal Finished Manual" for recommended relative to applying and designating finishes.

B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.

C. Apply primers and organic finishes to doors and frames after fabrication.

2.7 GALVANIZED STEEL SHEET FINISHES

A. Surface Preparation: Clean surfaces with non-petroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.

B. Factory priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.

1. Shop Primer: Zinc-dust, zinc oxide primer paint complying with performance requirements of FS TT-P-641, type II.

2.8 STEEL SHEET FINISHES

A. Surface Preperation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill sacle and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (pickling).

B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.

C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish aint systems indicated, and had capability to provide a sound foundation for field applied topcoats. Apply primer immediately after surface preparation and pretreatment.

3. EXECUTION

3.1 INSTALLATION

A. Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent, anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
4. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
5. Install fire-rated frames according to NFPA 80.

C. Door Installation: Fit hollow-metal doors accurately in frames, with clearances specified in ANSI/SDI 100.

1. Fire-Rated Doors: Install with clearances specified in NFPA 80.

3.2 ADJUSTING AND CLEANING

A. Prime Coat Touchup: Immediately after erection, sand smooth and rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames

END OF SECTION 08110

SECTION 08350

FOLDING DOORS AND GRILLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Folding door complete including folding door panels, side jambs, finger guards, header, operator, control, and bottom door pivots.

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Guard rail for swing zone protection.

B. Section 08710 - Door Hardware: Cores for cylinder locks.

1.3 REFERENCES

A. AAMA: Architectural Aluminum manufacturers Association.

B. ANSI/BHMA A156.10: American National Standard for Power Operated Doors.

C. ASTM B 221: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. [Product Data]: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements:
1. Elevations.
2. Hardware mounting heights.
3. Detail sections of fittings.
4. Anchorages and reinforcement.
5. Glazing details.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Not less than 5 years experience in the actual production of specified products.

B. Installer Qualifications: Firm with 5 years experience in installation or application of systems similar in complexity to those required for this Project, plus the following.
   1. Authorized distributor of manufacturer.

C. Product Requirements: Product shall meet the following standards.
   1. CPSC 16 CRF Part 1201 category II.
   2. ANSI/BHMA A156.10.
   3. UL Standard 325.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Install in areas designated by Architect.
   2. Do not proceed with remaining work until installation is approved by Architect.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Provide templates, wiring diagrams, fabrication details, and other information to providers of related work to coordinate the proper installation of the automatic sliding doors.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: KM Systems, Inc., 4910 Starcrest Drive, Monroe, NC 28110-1937. ASD. Toll Free Tel: (800) 438-1937. Tel: (704) 289-9212. Fax: (704) 289-2024. Email: mike@kmsystemsinc.com. Web: http://www. kmsystemsinc.com.

B. Substitutions: Not permitted.

2.2 APPLICATIONS/SCOPE

A. Provide complete installation including operator, folding door, glass, sidelight side jambs, headers with roller track, bottom door guides, activation and safety/security devices.

B. Automatic Folding Door:
   1. Series 4100 Ultra-Fold - Surface Applied Folding Door.
   2. Series 4200 Ultra-Fold - Overhead concealed Folding Door.
   3. Operation:
      a. Two panel single fold: Refer to drawings for configuration.
   4. Design:
      a. Narrow style aluminum: 2-1/2 inches (64 mm) top rail and 2 inches (51

mm) stile.

b. 3-1/2 inches (89 mm) bottom rail. (standard)
c. 5-5/8 inches (143 mm) bottom rail.
d. 7-1/8 inches (181 mm) bottom rail.
e. 10-5/8 inches (270 mm) bottom rail.
f. No muntin rail. (standard)
g. 4 inches (102 mm) muntin bar.
h. 5 inches (127 mm) muntin bar.
i. 6-1/2 inches (165 mm) muntin bar.
j. 8 inches (203 mm) muntin bar.

5. Construction:
   a. Infold / Break-in.
   b. Infold / Break-out.
   c. Outfold / Break-in.
   d. Outfold / Break-out.
   e. Thickness: 1/4 inches (6 mm).
   f. Thickness: 1/2 inches (13 mm).
   g. Thickness: 5/8 inches (16 mm).
   h. Thickness: 3/4 inches (19 mm).
   i. Thickness: 1 inches (25 mm) insulating glass.
6. Finish:
   a. Clear anodized.
   b. Dark bronze anodized.
   c. Medium bronze anodized.
   d. Black anodized.
   e. Custom anodize - Refer to drawings.
   f. Paint finish - Refer to drawings.
   g.
7. Provide threshold and sweep.

2.3 MATERIALS

A. Aluminum: 6063-T5 alloy minimum wall thickness of 0.125 inches (3 mm) to comply with ASTM B221.

B. Door Carrier Assembly: Four steel, precision, sealed ball bearing rollers and Grade 8 alloy steel hanger bolts.

C. Glass: To comply with requirements of Section 08810.

2.4 FABRICATION

A. Door and Sidelight Construction: 3/8 inches (10 mm) diameter threaded steel rod full width concealed in the top and bottom rails and secured with integral lock nuts. Wool double weather pile shall run full height of the lock stile and hinge stile of the FX panel and the catch stile and hinge stile of the FX four panel units. Wool weather pile shall run full height of the pivot stile of the FS panel. 1 inches (25 mm) vinyl finger guard shall be installed on pivot jambs and hinge stiles of FS panel.

B. Operator:
   1. Folding door operator shall be electromechanical, completely self-contained, and comply with ANSI/BHMA A156.10 and UL325. Operator and control shall be completely concealed above the doors in an extruded aluminum header with removable access cover. The door opening force shall be generated by a permanent magnet DC motor driving a combination spiral bevel/spur gear reducer and transmitted to the door through an arm linkage.

2. Opening speed shall be adjustable with dual back check control for speed and position. Closing shall be by spring force generated by two high quality compression springs. Adjustable closing speed and fixed latch speed shall control the doors in the closing cycle.
3. The doors shall be operable manually at any time, without damage to the operator or components.
4. Provide a multi-function microprocessor control with adjustable hold open time (1 - 30 sec.), LED indications for actual position unknown, system status, open obstruction shutdown, activation signal, safety mat/sensor signal, Stop-and-Hold signal, and mode selector switches providing a means for easy field selection of the following functions:
   a. Open obstruction shutdown.
   b. Ratchet activation mode.
   c. Stack pressure.
5. Control shall be capable of receiving activation signals from any device with N.O. dry contact output. All activation modes shall provide fully adjustable opening speed. The door shall be held open by low voltage applied to the continuous duty motor.
6. The control shall include a standard 3-position toggle switch with functions for ON, OFF, and HOLD OPEN.

C. Emergency Egress:
1. Folding doors shall be capable of being swung out to 90 degree from any position of the folding movement in the direction of egress and require no more than 50 lbf. (222 N) of force applied at the lock stile to open. Units shall comply with Chapter 5 ANSI/NFPA 101.

2.5 CONTROLS

A. Activating Devices: Installed in a location in compliance with ANSI A156.10 and all local codes.

B. Safety Devices:
1. Safety device(s) shall be installed and protect the fold area of the door in compliance with ANSI A156.10.
2. The control shall include an adjustable SafetyWatch circuit that monitors door operation and shuts the motor off if an open obstruction is sensed. The control shall include a SafetyFirst recycle feature that reopens the door if an obstruction is sensed at any point during its closing cycle.

C. Security Devices:
1. Provide Adams Rite Maximum Security hook bolt deadlock. Four panel units shall include a threshold bolt for two-point locking.

2. Provide two point locking with a cylinder-operated flush bolt installed in the FS panel to lock the FS panel into the breakaway catch assembly.

2.6 FINISH

A. Clear Anodized: Class I, Clear Anodic Finish: AA-M12C22A41.

B. Color Anodized: Class II, Color Anodic Finish: AA-M12C22A32/A34.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions detrimental to proper or timely completion.

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

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install all-glass doors and accessories in compliance with manufacturer's recommendations.

C. Set units level, plumb, and true to line. Adjust operating hardware to ensure proper operation.

D. Seal door and sidelight frames to adjoining construction.

E. Set threshold flush at floor line and adjust sweep to contact continuously along entire bottom of door.

F. Adjust doors and hardware:
   1. Provide tight fit at contact points and at weatherstripping, for smooth operation and weathertight closure. Lubricate hardware and other moving parts.
   2. Adjust operator, controls and safety devices to manufacturers specifications in compliance with UL 325.

G. Clean glass surfaces after installation, complying with requirements contained in Section 08810 for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08351

FOLDING DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Accordion Folding doors.

B. Panel Folding doors.

C. Bifold Doors.

D. Bifold Mirror Doors

E. Fire-rated Folding Doors.

1.2 RELATED SECTIONS

A. Division 5 Section “Metal Fabrications” for support of and blocking for partition tracks, jamb conditions, pocket doors, motor operators, and controls; and for prepunching metal support members.

B. Division 8 Section “Door Hardware” for cylinders for lockable jambs.

C. Division 8 Section “Access Doors and Frames” for access pane4ls to controls of fire-rated doors.

1.3 Quality Assurance

A. Installer Qualifications: A firm or individual authorized, approved, or licensed by fire-rated folding door manufacturer to install manufacturer’s products.

B. Fire-Test-Response Characteristics: Provide folding doors with the following fire-test-response characteristic tics, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: As follows, per ASTM E 84:

a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 450 or less.

C. Fire-Rated Folding Doors: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to [NFPA 252] [UBC Standard 7-2] [UL 10B] .

1.5 Project Conditions

A. Field Measurements: Verify folding door openings[and storage arrangements] by field measurements before fabrication and indicate measurements on Shop Drawings.

Part 2 - Products

2.1 Manufacturers

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection.

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

2.4 Bifold Doors

A. General: Provide folding doors hinged together in pairs and supported on pivots at jamb, with floor overhead track and door guide pins.

B. [Available] Manufacturers:

1. Dunbarton Corporation; Slimfold Division.

C. Metal Panels: Sizes as indicated, formed from nominal .0239 inch-(.6-mm-) thick, cold-rolled steel sheet. Channel form vertical edges and weld cross b racing to panel and channel-formed edges.

1. Surface Profile: [Fully lonvered] [Flush] [Paneled] [Louvered and paneled]

2. Protective Finish: Hot-dip galvanized coating applied to panels, stiffeners, hinges, and decorative trim.

3. Baked Finish: baked-enamel factor finish in [white] [black] [brown].

D. Hardware: Manufacturer’s standard felt pads, screws, and [pulls] [knobs] in standard finish. Hinges, pivots, and rollers factory installed and as follows.

1. Hinges: Three self-aligning hinges for pair of panels up to 96 inches (2438mm) high.

2. Hinges: Four self-aligning hinges for pair of panels more than 96 inches (2438mm) high.

3. Guides and Pivots: Not less than 5/16inch (7.9mm) diameter, adjustable screwtype, weight-bearing, zinc-plated pivot rod held in place by nylon rod clamp assemblies. With not less than ¼ inch (6.4mm) diameter, spring-loaded, self-aligning, zinc-plated steel guide rods and top pivot rods held in place by nylon sleeves.

4. Track: [Prefinished rolled steel with baked-enamel paint finish] [Aluminum extrusion, alloy6063-T5, 0.05 inch (1.3mm) thick, with manufacturer's standard metal finish].

Part 3 – Execution

3.1 Examination

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of folding doors, and the following.

1. Verify that headers are level with finished floor to within plus or minus 1/16 inch (1.6 mm) tolerance over the entire length of opening.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation

A. For folding doors supported by or anchored to permanent construction, advise installers of specific requirements for placement of anchorage devices. Furnish installers of other work with templates and drawings showing locations of anchorage devices and similar items.

B. In path of fire-rated folding doors, level floor with header to tolerance of plus or minus 1/16inch (1.6mm) across opening; grind or fill floor as necessary.

3.3 Installation

A. General: Install folding doors to comply with manufacturer's written installation instructions. Install track in one piece.

1. Comply with NFPA 80 for installing fire-rated folding doors.

B. Standard Floor Clearances: ¼ to ¾ inch (6.4 mm to 19 mm) maximum (above floor finish).

1. Comply with NFPA 80 for clearances required for fire-rated folding doors.

C. Coordinate provisions for electrical service, sensing devices, and final connections for fire-rated folding doors.

3.4 Adjusting

A. Adjust units as necessary to ensure smooth, quiet operation without warping or binding. Check and readjust operation hardware so latches engage accurately and securely without forcing or binding.

3.5 Demonstration.

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-rated folding doors. Refer to Division 1 Section "Demonstration and Training".

SECTION 08500

ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Double Hung Windows.

1.02 RELATED SECTIONS

A. Section 07160 – Sheet Vapor Retarders – Joining of air, vapor and waterproof membranes to window frames.

B. Section 07900 – Joint Sealers – Caulking of joints between frames and other building components.

C. Section 08700 – Requirements regarding Hardware.

D. Section 08800 – Glazing.

1.03 REFERENCES

A. AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC), and Wood Windows and Glass Doors.

B. AAMA 1503.1 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.

C. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

D. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

E. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.

F. CAN/CSA-A440-M90 – Windows.

G. CAN/CSA-Z91-M91 – Safety Code for Window Cleaning Operations.

1.04 SUBMITTALS

A. Submit under provisions of Section 01330.

B. Shop Drawings: Show dimensions of windows, elevations, details of all window sections, anchorage and installation details, hardware, and interface with other products.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver windows to project site in undamaged condition; handle windows to prevent damage to components and to finishes.

B. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Frame, Sash and Screen Members: Extruded aluminum alloy 6063-T6; 0.062 inch (1.57 mm) minimum wall thickness.

B. Thermal Barrier: Complete metal to metal separation between inner and outer frame members; not less than 1/4 inch (6.3 mm) wide. Poured and debridged polyurethane thermal barrier is not acceptable.

C. Weatherstripping: 100 percent woven pile with Mylar center fins.

D. Screens: Tubular aluminum frames; screen cloth securely held in place by means of reusable vinyl splines.

E. Hardware: Spring-loaded metal plunger type or spring-loaded pinch type. Lock to engage automatically as window is closed; locate at interior sill rails.

F. Double Hung Window Balances: Block and Tackle zinc die cast metal with nylon rollers, capable of providing positive lifting force through full range of sash travel and holding sash stationary at any open position without the use of auxiliary frictional devices or holding clips; overhead balances, exposed balance cables, or fasteners are not acceptable. Use a minimum of 2 balances per sash.

2.02 FABRICATION

A. General:

1. Fabricate windows as two separate frames permanently interlocked by a rigid thermal barrier.

2. Operable Frame and Sash Joints: Butt type secured by means of thread-cutting type screws anchored into screw ports, ports integral parts of frame members.

3. Corners: Joined neatly in a manner to provide watertight connections. All frame corners to be fitted with a neoprene gasket.

4. Deburr and make smooth all sharp milled edges and corners.

B. Sill Frames: Tubular sections, formed from single extrusions (2-pieces joined to form a tube are not acceptable), 5-degree minimum slope with a closed-weep system (including aluminum weep flaps) to prevent accumulation of water in sill and intrusion of insects.

C. Thermal Barrier: Interlock both halves of frame, securing them together without inhibiting expansion and contraction of either part; apply bead of sealant to complete perimeter of window to seal joints between frame and thermal barrier.

D. Weatherstripping: Double weatherstripped all sash at perimeter of master frame. All weatherstrip to be contained in profiles extruded into the sash pockets of the master frame to prevent movement and excessive wear. Except at meeting stiles, weatherstrip contained in sash rails shall not be accepted. Secure weatherstripping to prevent movement.

E. Fully balance each sash with a minimum of two balanes.

F. Locate balances inside jamb sash; make removable with the use of take out clips for ease of replacement without the use of special tools.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until openings have been properly prepared.

B. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the project conditions.

3.03 INSTALLATION

A. Install windows and related components in accordance with approved shop drawings and manufacturer's requirements.

B. Erect materials plumb, level, and true relative to the building structure, maximum variation from plumb and level not exceeding 1/8 inch in 10 feet (3 mm in 3 m).

C. Install approved insulation materials in the frame cavity on the interior portion of the window frame, area adjacent to exterior of window frame remaining uninsulated.

D. Apply calking at all points between masonry and aluminum outer frame; apply in a manner to ensure airtight and watertight continuous perimeter seal so as to prohibit seepage of cold air into the insulated cavity.

3.04 CLEANING

A. After installation, remove all sealants, calking, and other misplaced materials from all surfaces, including adjacent work.

B. Thoroughly clean window frames, casings, and glass using materials and methods recommended by the window and glass manufacturer that do not cause defacement of work.

END OF SECTION

SECTION 08710

Door Hardware

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

A. This Section includes items known commercially as finish or door hardware that are required for swing doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following:

1. Lock and latch sets

2. Butts and Hinges

3. Door stripping and Seals

1.3 HARDWARE ALLOWANCE

A. Door hardware supplier’s responsibilities shall be as follows

1. Submittals: Submit through Construction Manager required product data, final hardware schedule, separate keying schedule, and samples as specified in this Section, unless otherwise indicated.

2. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.

B. Construction manager responsibilities shall be as follows:

Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.

1. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Butts and Hinges

   a. Stanley Hardware, Div. Stanley Works

2. Locksets

   a. Schlage

3. Latches

   a. Triangle Brass Manufacturing Company (Trimco)

4. Door Stripping and Seals:

   a. Pemko manufacturing Co., Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each hardware item in compliance with the manufacturer's instructions and recommendations.

B. Set units level, plumb, and true to line and location.

3.2 ADJUSTING, CLEANING

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit.

B. Clean adjacent surfaces soiled by hardware installation.

END OF SECTION

SECTION 08710

PANIC HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for panic hardware.

1.02 RELATED SECTIONS

A. Section 08114 – Standard Steel Doors.

B. Section 08115 – Standard Steel Frames.

C. Section 08710 – Door Hardware

D. Section 08770 – Door Accessories

1.03 REFERENCES

A. ANSI A117.1 – Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

B. ANSI/BHMA A156.2 – Bored and Pre-Assembled Locks and Latches.

C. ANSI/BHMA A156.18 – Materials and Finishes.

D. ANSI/NFPA 101 – Life Safety Code.

E. UL 437 – Standard for Safety.

F. ANSI/DHI A115.IG – Installation guide for Doors and Hardware.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide manufacturer's standard catalog data for specified products demonstrating compliance with references standards.

C. Shop Drawings: Submit hardware schedule showing functions, finishes, mounting heights and keying schedule for each door and opening required.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Manufacturer's original, unopened, undamaged containers, identification labels intact.

D. Handle and store products according to manufacturer's recommendations published in technical materials. Leave products wrapped or otherwise protected and under clean and dry storage conditions until required for installation.

E. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

F. Protect hardware from theft by cataloging and storing in secure area.

1.07 MAINTENANCE

A. Extra Materials: Deliver to owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels.

PART 2 PRODUCTS

A. Panic Hardware to be Corbin Russwin ED5000 Exit Devices as described on door hardware schedule.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install doors and hardware in accordance with manufacturer's templates and instructions and ANSI/DHI A115.IG – Installation Guide for Doors and Hardware.

B. Where ever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during finish application. After completion of finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on substrate.

3.02 ADJUSTING AND CLEANING

A. Adjust hinge sets, locksets, and other hardware. Lubricate using a suitable lubricant compatible with door and frame coatings.

B. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before owners acceptance.

C. Remove from project site and legally dispose of construction debris associated with this work.

END OF SECTION

3.6APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards: Comply with ASTM C 840 and GA-216.
B. Install sound-attenuation blankets where indicated.
C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5mm) of open space between panels. Do not force into place.
E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.
F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
G. Attach gypsum panels to framing provided at openings and cutouts.
H. Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32 inches (813mm) wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.
I. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.
J. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.) except in chases that are braced internally.
    1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq mi) in area.
    2. Fit gypsum panels around ducts, pipes, and conduits.
    3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow ¼- to 3/8- inch- (6.4- to 9.5-mm) wide joints to install sealant.
K. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide ¼- to ½- inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim

where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.
    1. Space screws a maximum of 12 inches (304.8mm) o.c. for vertical applications.

M. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2mm) o.c.

SECTION 09250

Gypsum Board Finishing

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finishing For Gypsum Board.

1.02 RELATED SECTIONS

A. Section 09215 – Veneer Plaster.

B. Section 09950 – Pre Finished Gypsum Wall Panels.

1.03 REFERENCES

A. ASTM C840 – Specification and Application and Finishing of Gypsum Board.

B. ASTM C475 – Standard specifications for Joint Compound and Joint Tape for Finishing.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Packaging and Shipping: Have materials shipped in manufacturer's original packages showing manufacturer's name and product brand name.

B. Storage and Protection: Store materials inside and protected from damage by the elements. Protect ends, edges, and faces of gypsum boards from damage.

C. Protect tapes and spackling compounds from drying out.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Establish and maintain application and finishing environment in accordance with ASTM C 840.

PART 2 PRODUCTS

2.01 MATERIALS

A. Joint Tape: ASTM C475, paper tape, 2 inch wide

B. Joint Compound: ASTM C475

C. Wood Framing: Section 06100

D. Regular Gypsum Board: A gypsum core wall panel surfaced with paper on front, back, and long edges and complying with ASTM C 36 and C 1396.

2.02 MIXES

A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using proportion method.

B. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270, Type N, using proportion method.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install Metal Framing according to ASTM C 754.

B. Install Gypsum Board according to ASTM C 1280.

C. Install Gypsum Board and Joint Treatment according to ASTM C 840.

3.02 FIELD QUALITY CONTROL

A. Protect gypsum board installations from damage and deterioration until the date of Substantial Completion.

END OF SECTION

SECTION 09250

GYPSUM BOARD

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gypsum board , including joint treatment

1.02 RELATED SECTIONS

A. Section 07210 - Building Insulation: Thermal insulation.
B. Section 05400 - Cold Formed Metal Framing.
C. Section 07840 - Firestopping.
D. Section 08310 - Access Doors and Panels.

1.03 REFERENCES

A. BOCA® National Building Code

B. Standard Building Code

C. Uniform Building Code

D. CABO One- and Two-Family Dwelling Code

E. Gypsum Association Brochures GA-214, GA-216 and GA-600

F. ASTM C 475, C 514, C 645, C 754, C 840, C 1002, C 1047, E 119

G. As a member of the Gypsum Association, James Hardie's Regular Gypsum Board is recognized for use in ICBO Evaluation Service Reports #1632 and #1874

1.04 DELIVERY AND STORAGE

Hardirock gypsum boards should be stacked flat on a smooth, level surface, but not stored directly on concrete floors. When spacers are used, position them closely enough together to minimize warpage. Care should be taken to prevent damage to edges and corners. Always keep Hardirock gypsum board dry prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

James Hardie Gypsum

26300 La Alameda, Suite 250
Mission Viejo, CA 92691
Toll-Free: (800) 753-1123
Fax: (949) 348-4508
Web site: http://www.hardirock.com

2.02 MATERIALS

Hardirock® Regular Gypsum Board For Non-Fire Rated Applications

A.1/4", 3/8" and 1/2" products are manufactured with the long edges tapered to facilitate the application of joint compound. High quality manila face paper provides a smooth surface that can be decorated with paint, texture or wallpaper.

1.**Gypsum Board For Ceiling Applications** -When tested in accordance with ASTM Test Method C 473, HD Board provided the same sag resistance as Hardirock 5/8" Fire X. Thickness- 1/2"

2.**Gypsum Board For Fire Rated Construction** -When 5/8" Fire X is used in specific construction assemblies, fire ratings of up to 4 hours can be achieved.((ASTM) C 36.)

3.**Improved Type X Gypsum Wallboard-**Both Hardirock® 1/2" and 5/8" Max “C” gypsum wallboard meet or exceed all requirements specified in American Society for Testing and Materials (ASTM) C 36.

4.**Gypsum Board For Wet Area Applications** -(ASTM) C 630

B. Accessories

Metal Studs

Track, furring channels, screws and other components including insulation as
20-gauge studs for maximum abuse resistance and
tracks of dimension and gauge for required assembly and fire rating.

Trim Accessories

General: Provide standard trim accessories for drywall work. Provide galvanized steel unless otherwise indicated.

Joint Treatment Materials

A. Joint Tape: for reinforcing joints, as per type recommended.

B. Joint Compound:bedding tape

C. Provide auxiliary materials for gypsum drywall work of the type and grade recommended
to include screws, nails, adhesives, sealants, sound blankets and insulation

PART 3 EXECUTION

3.01 EXAMINATION

A.Coordinate with other trades for provisions for insulation, refractory fiber, blocking, metal backing plates, special anchors, access doors and

panels, and ensure that such items are properly located and installed prior to installing wall finish.

3.02 INSTALLATION

A. General: Use Gypsum Board Application and Finishing Standards, ASTM C 840, GA-216 and
GA-650.
B. Install sound attenuation blankets where indicated.

C. Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high
walls, install boards horizontally with end joints staggered over studs, except where local
codes or fire-rated assemblies require vertical application.

D. Install gypsum board with face side out. Do not install damaged or damp boards.

E. Locate edge or end joints over supports. Stagger vertical joints over different studs on
opposite sides of wall.

END OF SECTION

SECTION 09310

CERAMIC TILE

PART 1 GENERAL

1.01 DESCRIPTION

A. General: Provide ceramic tile in accordance with the Contract Documents.

1.02 QUALITY ASSURANCE

A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, composition, and variety of tile form a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality form one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

C. Single-Source Responsibility for Waterproofing Materials: Obtain waterproofing materials and associated accessories from one manufacturer for each type waterproofing system.

D. Installer Qualifications: Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. TCA “Handbook for Ceramic Tile Installation”.

2. ANSI A137.1 “Standard Specifications for Ceramic Tile.”

3. ANSI A108/A118/A136 “Standard Specifications for the Installation of Ceramic Tile.”

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Samples: Submit samples of each type, class and color of tile, not less than

12 in. square on plywood backing, and grouted as required. Sample submittal and Architect's acceptance shall be for color, pattern, and texture only. Compliance with all other requirements is the responsibility of the Contractor.

B. Manufacturer's Data: Submit manufacturer's technical information, specifications and installation instructions for each material required.

C. Certification:

1. Submit a Certificate of Compliance to ANSI A137.1 prior to submission of samples for review.

2. Furnish a "Master Grade Certificate" in the form of approved in ANSI 137.1 for each type of tile, signed by the manufacturer, certifying to the grade, type and quantity of tile, together with satisfactory information for identification of the containers to which they apply. These certificates shall be supplied promptly after material has been shipped from the factory.

3. Submit certification from the manufacturers of dry-set mortar and grouts that their products conform to the appropriate ANSI "Materials" specifications.

1.05 PRODUCT HANDLING

A. Deliver materials, other than bulk materials, in manufacturer's unopened containers fully identified with grade labels as specified in TCA 137.1, and with name, brand, type, class, size, color, and pattern. Store all materials above grade and protect from weather and damage from any source. Store in accordance with manufacturer's instructions.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If despite these precautions coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

D. Material Safety Data Sheets: Submit Material Safety Data Sheets with products delivered to jobsite.

1.06 PROJECT CONDITIONS

A. Maintain project conditions and protect the Work during and after installation as required to comply with referenced standards, manufacturer's written recommendations and instructions.

B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

C. Maintain temperatures at 50 deg. F. or more in tiled areas during installation and for days after completion, unless higher temperatures and/or longer curing times are required by referenced installation standard or manufacturer's instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tile Products

1. General: Provide tile of domestic manufacture, "Standard Grade", complying with ANSI A137.1. Tile shall match samples accepted by architect. Obtain each material required for any one type and color of tile work from a single source, so as to minimize variations in appearance and quality.

2. Ceramic Wall Tile: Non-vitreous white body with matte or gloss finish, cushion edged, spacer lugs on all four sides; Colors and sizes as specified in the Tile Schedule. (Architect reserves the right to use 16 tile sheets pregrouted with white silicone sealant).

3. Unglazed Ceramic Mosaic Tile: Porcelain impervious body with through body color, cushion-edged and PVC-mounted into 12 in. x 24 in. sheets. (Flat tile mounted onto mesh, perforated paper or other sheet material is unacceptable when such material is to remain in place after installation). Colors and sizes as specified in the Tile Schedule.

4. Glazed Ceramic Mosaic Tile: Porcelain impervious body, cushion-edged and PVC-mounted into 12 in. x 24 in. sheets. (Flat tile mounted onto mesh, perforated paper or other sheet material is unacceptable when such material is to remain in place after installation). Colors and sizes as specified in the Tile Schedule.

5. Quarry Tile: Vitreous body, unglazed, square or cushion edged, 6 in. square, 1/2 in. thick unless otherwise shown or specified. Where slip-resistance quarry tile is shown or specified, surface shall include embedded aggregate. Provide a 6 in. high sanitary cove in areas shown, specified or required by code authorities having jurisdiction. Colors and sizes as specified in the Tile Schedule.

6. Trim Shapes: Shaped as shown for typical conditions and as required to make a complete installation at all conditions including all required cove type bases, bull-nosed round external corners and square internal corners.

Wainscots shall be topped with bullnose trim. Match type, class, color, and edge of adjoining field units and coordinate sizes with field units.

B. Stone Thresholds

1. Marble Saddles: Fabricate from highest grade Madre Cream Alabama or Georgia White marble, having a minimum abrasion hardness (Ha) of 10.0when tested in accordance with ASTM C241, thickness as shown with chamfered corners and eased edges, cut from sound stock, uniform in color, free form cracks, and spalled edges. Honed finish on exposed surfaces.

C. Waterproofing Materials

1. Polyethylene Sheet Waterproofing: Manufacturer's standard proprietary product complying with ANSI A118.10 and consisting of non-plasticized chlorinated polyethylene (CPE) sheets, 60 inches wide by a nominal thickness of 0.040 in. Provide preformed outside an d inside corners, pipe protrusion collars, cap strips, seaming adhesive and other accessories as required for a complete waterproof installation. Provide one of the following:

a. "Chloraloy 240" (The Noble Co.).

b. "Chloraloy 240" (American Olean).

c. "Chloraloy 240" (Dal-Tile).

E. Miscellaneous Materials

1. Water: Clear, potable, and without deleterious substances which would impair the work.

2. Pigments: Pure mineral pigments, resistant to alkalies, non-fading and weatherproof, colors as required to match Architect's sample.

3. Reinforcement: ASTM A185, 2in. x 2in. x 14ga. Welded wire mesh, galvanized.

4. Metal Lath: 3.4 lbs per sq. yard expanded, self-furring, zinc coated metal lath, with zinc coated nails and galvanized wire anchorage.

5. Primer or Slurry Bond Coat (for Substrate): As recommended by manufacturer of setting bed.

6. Cementitious Backer Board: One of the following:

a. "Durock" (U.S. Gypsum Co.); 1/2 in. thick.

b. “WonderBoard” (Modulars Inc.); 7/16 in. thick.

c. “Util-A-Crete” (FinFan Inc.); 1/2 in. thick.

7. Sound Control Matting: 0.40 in. thick composite of nylon filaments forming a 3 dimensional geomatrix with a non-woven fabric heat bonded to upper surface. Provide Enkasonic Sound Control Matting (Akzo Nobel Geosynthetics Co.) or approval equal. Provide manufacturer recommended and supplied 3/8 in. thick polyethylene foam perimeter isolation pad.

8. Metal Edge Strip: Shape, metal, finish and anchorage system as shown. If not shown, provide stainless steel terrazzo strips, 1/8 in. wide at top edge with integral provision for anchorage to mortar bed or substance.

2.02 MORATRS AND GROUTS

A. Basic Setting Materials

1. Portland Cement: ASTM C150, Type 1; white where required to match Architect’s sample.

2. Hydrated Lime: ASTM C206, Type S, or ASTM C207, Type S.

3. Sand: ASTM C144.

B. Portland Cement Mortar: Comply with ANSI A108 Standards for mixes.

C. Dry-Set Mortar: Factory pre-mixed. Comply with ANSI A118.1 and with TCA Formula 759 for use with impervious and vitreous tile, and with TCA Formula 763 for use with non-vitreous tile.

D. Latex Additive for Latex-Cement Mortar: ANSI A118.4, liquid acrylic or SBR resin type latex additive for mixing with specified manufacturer’s prepackaged dry set mortar mix to produce cement mortar. Provide one of the following:

1. “Hydroment Multi-Purpose Acrylic Additive No. 425” (Bostik Construction Products).

2. “Keralastic” (Mapei Corp.).

3. “Laticrete 4237 Latex Additive” (Laticrete International Inc.).

E. Organic Tile Adhesive: ANSI A136.1, Type 1.

F. Grout for Non-Vitreous Body Tile: Color as shown or required to match Architect’s sample and complying with ANSI A118.6; one of the following:

1. “Hydroment Dry Tile Grout” (Bostik Construction Products).

2. “Laticrete Dry Set Wall Grout” (Laticrete International, Inc.).

G. Grout for Porcelain Body Tile: Color as shown or required to match Architect’s sample and complying with ANSI A118.6; one of the following:

1. “Keracolor Floor” (Mapei Corp.).

2. “Hydroment Ceramic Tile Grout” (Bostik Construction Products).

3. “Laticrete Floor Grout and Joint Filler” (Laticrete International, Inc.).

H. Grout for Quarry Tile: Color as shown or required to match Architect’s sample and complying with ANSI A118.6; one of the following:

1. “Hydroment Multi-Purpose Joint Filler” (Bostik Construction Products).

2. “Keracolor Floor” (Mapei Corp.).

3. “Laticrete Floor Grout and Joint Filler” (Laticrete International, Inc.).

I. Latex Additive for Latex-Cement Grout: ANSI A118.6, liquid type latex additive for mixing with manufacturer’s prepackaged grout mix. Provide one of the following:

1. “Latacrete 1776 Grout Admix” (Laticrete International, Inc.).

2. “Hydroment Multi-Purpose Acrylic Additive No. 425” (Bostik Construction Products).

3. “Plastijoints Grout Reinforcer” (Mapei Corporation).

2.03 TILE SCHEDULE

A. General: Provide tile and accessories for each type tile specified below as produced by one manufacturer. Products specified herein by proprietary designation are as specified below and establish the quality standards required. Equivalent products of other manufacturers will be considered provided thay meet those established standards.

B. CT-1: “Mfr. No. DK-482 Keystone Mosaic Tile” (Dal-Tile); 1 in. x 1 in.; matte finish; color: Sterling.

C. CT-2: “Mfr. No. DK-31 Keystone Mosaic Tile” (Dal-Tile); 1 in. x 1 in.; matte finish; color: White.

D. CT-3: “Mfr. No. DM-100 Modular Glazed Wall Tile” (Dal-Tile); 3 in. x6 in.; high gloss finish; color: White.

E. CT-11: “Quest” Quarry Tile (American Olean); 6 in. square; unglazed finish; color: Bay Blue Q51.

PART 3 EXECUTION

3.01 CONDITION OF SURFACES

A. Examine the substrates, adjoining construction and the conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected. Verify that the substrates for setting tile are firm, dry, clean, and free from oil laitance, waxy films and curing compounds. Confirm that installation of grounds, anchors, recessed frames, electrical, plumbing and mechanical elements, and similar items located in or behind tile has been completed prior to beginning the Work.

B. Allowable Variations in Substance Levels

1. Mortar Set Floors: +/- 1/4 in. in 10 ft. distance and 3/8 in. total maximum variation from levels shown.

2. Thin-Set Work: Same as allowable variations in finished work.

C. Grind or fill concrete, masonry and plaster substrates as required to comply with allowable variations.

3.03 PREPATATION

A. Mechanically scarify concrete substrate by sandblasting, grinding or a portable shot blast cleaning system as may be required to provide a proper surface or to remove curing compounds or other surface contaminants that would interfere with proper bond of mortar, waterproofing membrane, or adhesive for tile.

B. Seal substrate with a sealer if and as recommended by manufacturer of mortar or adhesive.

C. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that the tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.04 INSTALLATION

A. Unless otherwise shown or specified comply with the referenced standards and the manufacturer's instructions.

B. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.

C. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes and alignments shown:

1. Floors: 1/8 in. in 10 ft. run, any direction; +/- 1/8 in. at any location; 1/32 in. offset at any location.

2. Walls: 1/8 in. in 10 ft. run, any direction; +/- 1/8 in. at any location; 1/32 in. offset at any location.

3. Joints: +/- 1/32 in. joint width variation at any location; 1/16 in. in 3 ft. run for deviation from plumb and true, and for other variations in alignment of joints.

D. Lay out tile work in pattern shown using field tile and trim shapes as shown or required. Center tile fields both directions in each space or on each wall area and adjust to minimize tile cutting. Use uniform joint widths of 1/16 in. for ceramic tile and 1/4 in. for quarry tile unless otherwise shown. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Adjust to minimize tile cutting. Cut field tile, not trim shapes, unless otherwise shown. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars or covers overlap tile. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that the extent of each sheet is not apparent in finished work.

E. Extend tile work into recesses and under equipment and fixtures in the spaces shown or scheduled to receive tile. Form a complete covering without interruptions except for control and expansion joints as shown and as required to comply with requirements. Terminate work neatly at obstructions, edges and corners without disruption of pattern or joint alignments.

F. Sheet Waterproofing Installation: In areas shown, install sheet waterproofing as per recommendations and written instructions of the manufacturer.

G. Sound Control Matting: In areas where indicated, and in accordance with manufacturer's written instructions, provide sound control matting as follows:

1. If scheduled, provide sheet waterproofing as specified above installed as per manufacturer's recommendations.

2. Provide polyethylene foam at perimeter of the entire subfloor and around any protrusions through the installation. Tape off tack glue polyethylene foam to substrate.

3. Install sound control matting with black matrix down and fabric side up, butting adjoining edges of black matrix with the fabric overlap taped or glued to the adjacent strip. Install mortar bed as specified herein.

H. Install reinforcement in all horizontal martar setting beds over membrane waterproofing.

I. Setting Tile on Portland Cement Mortar Setting Bed: Use latex modified dryset mortar to set tile on portland cement mortar setting bed. Compact and lebel the Portland cement mortar setting bed accurately and allow it to cure before installing tile. Comply with TCA Method F111, ANSI A108.1B and ANSI A108.5 for installation of tile by the dry-set method.

J. Dry-Set Installation: Except for installations directly on wood or metal substrate use factory pre-mixed dry-set mortar with latex additive for dry-set tile work, unless otherwise shown. Install dry-set system over waterproofing membrane in accordance with membrane manufacturer's written instructions and recommendations. Comply with TCA Method F122 and ANSI A108.5 for installation of tile.

K. Adhesive Installation: Use organic tile adhesive for setting tile on gypsum wallboard and elsewhere as shown. Comply with TCA Methods W223 or W242 and ANSI A 108.4 for installation of tile.

L. Grout: Unless otherwise shown use factory pre-mixed grout with latex adhesive specified for non-vitreous body tile, porcelain body tile and for quarry tile. Comply with the following for grouting: ANSI 108.10.

M. Slip-Resistant Tile Installation: Use slip-resistant tile in areas shown as "Slip-Resistant". Install as specified for normal ceramic tile or quarry tile of the same type and class.

N. Marble Saddles: Install in one piece, fit neatly to door jambs and set in same type of setting bed as abutting field tile unless otherwise indicated. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish. Comply with TCA Method TH611.

O. Metal Edge Strip Installation: Install a continuous metal edge strip adequately anchored into the substrate.

3.05 CLEANING

A. In addition to the initial cleaning procedure reuired, and not more than 2 days before occupancy or preliminary acceptance by the Owner, clean ceramic tile work as recommended by the tile manufacturer and TCA.

B. Protect tile work during the construction period so that it will be without any indication of use or damage at the time of acceptance.

END OF SECTION 09310

SECTION 09310

TILE ADHESIVES, MORTARS AND GROUTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation for tile and other floor applications.

A. Setting mortars for tile applications.

B. Grouts and Caulks for tile applications.

C. Additives for setting mortars and grouts.

D. Adhesives for tile and other surface applications.

E. Sealers for tile and other surface applications.

1.2 RELATED SECTIONS

A. Section 03350 - Concrete Finishing: Troweling of floor slab for tile application.

B. Section 07900 - Joint Sealers.

C. Section 09300 - Tile: Ceramic, quarry and stone tile materials.

1.3 REFERENCES

A. ANSI A108 Series/A118 Series - American National Standards for Installation of Ceramic Tile; 1999.

B. ANSI A118.1 - Standard Specification for Dry-Set Portland Cement Mortar.

C. ANSI A118.3 - Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.

D. ANSI A118.6 - Ceramic Tile Grouts.

E. TCA (HB) - Handbook for Ceramic Tile Installation; Tile Council of America; 2001.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Selection Samples: Color charts for selection of grout.

D. Verification Samples: Actual samples of mortars, grouts, and adhesives, tested for compatibility in relationships to be found in project installation.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 PERFORMANCE REQUIREMENTS

A. Perform Work in accordance with TCA Handbook for Ceramic Tile Installation.

1.6 QUALITY ASSURANCE

A. Manufacturers Qualifications: Manufacturer shall have not less than 5 years successful experience manufacturing products specified in this section.

B. Installer Qualification: Installer shall have a minimum of 3 years experience with the type of products specified in this section.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Super-Tek Products, Inc, 25-44 Borough Place, Woodside, NY 11377 ASD. Telephone: (718) 278-7900. Fax: (718) 204-6013.

2.2 SURFACE PREPARATION

A. Super-Tek Super-Level: Pourable, self-leveling, polymer modified Portland cement, high compressive strength underlayment for use prior to installing ceramic tile, natural stone, resilient, carpet or glue down wood flooring. For interior use only.

2.3 MORTARS

A. Super-Tek Dual Mix: High Performance Portland cement thin-set mortar for residential to commercial interior installation applications of ceramic, quarry, marble, pavers and other natural stone tiles on floors and walls. Meets or exceeds ANSI 118.1.

2.4 GROUTS AND CAULKS

A. Super-Tek Dry-Set Unsanded Grout: Premium, unsanded Portland cement grout for filling joints between ceramic, quarry, pavers, marble, porcelain and other natural stone tiles where joint width is 1/8 inch (3 mm) or less. Meets or Exceeds ANSI 118.6. Color: As selected. Use Super-Tek's Acrylic Grout Additive in place of water for best color reproduction, exterior applications, and areas subject to freeze thaw conditions.

2.5 ADDITIVES

A. Superapoxy II: Two-component water-based epoxy additive for enhancing grout and Portland cement thin-set mortars. Designed for setting and grouting ceramic tile, marble, slate, stone, pavers, etc. Water-based, water-cleanable, non-flammable and resistant to chemical attack. Develops high bond strength and is equally effective when applied to wet or dry surfaces, above or below grade.

2.6 ADHESIVES

A. Super-Tek Dual Purpose Adhesive: High performance, ceramic tile adhesive for interior installations of all types of vitreous and non-vitreous ceramic wall and floor tile. Meets or exceeds ANSI 136.1 Type I and II standards, adhesives for areas requiring "Prolonged Water Resistance".

2.7 SEALERS

A. Super-Sealcote: Protects the surfaces of Portland cement grout and natural stone. It penetrates and helps protect against water absorption, stains and dirt accumulation making subsequent cleaning easier. Also suitable for sealing interior brick and masonry.

PART 3 EXECUTION

3.1 EXAMINATION

A. Before beginning installation verify that conditions of previously installed work under other sections is acceptable for installation of tile materials. Notify Architect in writing of unsatisfactory conditions.

B. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

3.2 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum surfaces.

C. Seal substrate surface cracks with acceptable filler.

D. Level and prepare substrate surfaces as specified for each product.

E. All surfaces, regardless of material, must be structurally sound, clean and free of dirt, oil, grease, wax, all loose scaly material, cleaning and sealing compounds, etc. Any degreasers or acids used in cleaning the floor must be thoroughly flushed away.

3.3 MORTARS

A. Super-Tek Dual Mix: Install in accordance with manufacturer's printed instructions, the applicable requirements of ANSI A108, the Tile Council of America's "Handbook For Ceramic Tile Installations" and the following:
   1. Mix in accordance with the manufacturer's instructions.
   2. All surfaces must be clean and free of dust, grease, wax, and foreign matter.
   3. Apply in accordance with manufacturer's printed instructions.
   4. All traffic should be kept off of floors for a minimum of 48 hours.
   5. Grouting may be accomplished in 24 hours if tiles are firmly set and kneeling boards are used.
   6. Latex additive must be used when installing porcelain tiles, for installations over cement backer board or exterior grade plywood, and for exterior applications.
   7. Jobsite temperature must remain between 45 degrees F (7 degrees C) and 95 degrees F (35 degrees C) for a minimum of 72 hours after installation.

3.4 GROUTS & CAULKS

A. Super-Tek Dry-Set Unsanded Grout: Install in accordance with manufacturer's printed instructions, the applicable requirements of ANSI A108, the Tile Council of America's "Handbook For Ceramic Tile Installations" and the following:
   1. Before grouting, tiles must be firmly set and all setting materials must be completely dry.
   2. Certain types of ceramic, marble and natural stone tiles can be stained by colored grouts. It may be necessary to seal tiles before grouting. Test a couple of tile samples and follow tile manufacturers' suggestions. Absorptive tiles must be wet prior to grouting to prevent them from absorbing water from the grout and causing shaded and or discolored grout.
   3. If grout dries at different rates, shading will occur. To help prevent shaded and or discolored grout, avoid drying variations caused by drafts, direct sunlight, heaters, air conditioners, etc. Protect installation from freezing and maintain uniform temperature and humidity for a minimum of 72 hours. When light

colored grouts are used (White, Almond, etc.) the setting material should be white to ensure color uniformity in the finished job.

4. Mix and apply in accordance with the manufacturer’s instructions.
5. All joints must be clean and free of excessive setting materials and tile spacers. The depth of the joint should be at least 2/3 the thickness of the tile. Variations in joint depth will cause grout shading.
6. Begin initial cleaning after the grout becomes firm. Wipe the face of the tile with a clean, lightly dampened sponge, rinsing and wringing it often. Use clean water for rinsing the sponge. Final cleaning may begin, when grout film (haze) appears on surface. Polish surface with dry terry-cloth rag. Never allow the grout or the grout haze to set and dry on the face of the tile. Do not use acid or bleach to clean grout, these products can discolor the grout and damage the tile.
7. Damp curing will further enhance the finished job. Cover the finished installation with non-staining Kraft paper for three days, or, wait 24 hours and then wipe the joints daily with a damp sponge or mop for three days. Damp curing is not necessary if grout is mixed with Acrylic Grout Additive in place of water.

3.5 ADDITIVES

A. Acrylic Grout Additive: Install in accordance with manufacturer's printed instructions. All joints to be grouted must be clean and free of dust, grease, sealants and foreign matter.

3.6 ADHESIVES

A. Super-Tek Dual Purpose Adhesive: Install in accordance with the applicable requirements of ANSI A108, the Tile Council of America’s “Handbook For Ceramic Tile Installations” and the following:
   1. Walls: Prime all extremely porous surfaces such as gypsum wallboard and shower walls with a thin, skim coat of adhesive. Allow drying until coating is not broken by trowel when applying notched coat (approximately 2-4 hours). Where exposed to excessive water such as where walls touch bathtub, cut away wall materials above tub by approximately 1/4 inch (6 mm) and fill void with adhesive. All joints, edges and voids in wall materials, including openings around pipes, should be filled or packed with generous amounts of adhesive. Let dry as with skim coat.
   2. Floors: Plywood flooring must be double layered, well screwed, and without bounce. Concrete must be fully cured (28 days required for new pours) and free of excessive moisture, alkalinity, and hydrostatic pressure. If below grade it must not be subject to seepage or dampness. Floors must be level to a tolerance of 1/8 inch (3 mm) variation within 3 lineal feet (91 cm).
   3. Apply adhesive in accordance with manufacturer's printed instructions.
   4. All traffic should be kept off of floors for a minimum of 48 hours.

5. Grouting may be accomplished in 24 hours if tiles are firmly set and kneeling boards are used.

3.7 SEALERS

A. Super-Sealcote: Install in accordance with the manufacturer's printed instructions and the following:
   1. Surface must be clean and dry.
   2. Spray or wipe on sealer. Saturate evenly and thoroughly.
   3. Wipe up excess sealer with clean, dry cloth. Allow to dry.

3.8 CLEAN-UP AND PROTECTION

A. Clean surfaces of tile and adjacent surfaces in accordance with manufacturer’s instructions.

B. Protect tile joints and surfaces until acceptance of the work.

3.9 SCHEDULE

A. Restrooms, Locker Rooms and Janitors Closets:
   1. Surface Preparation.
   2. Tile: Ceramic mosaic.
   3. Size: 1 x 1 inch (25 x 25 mm).
   4. Color: Color No.1 for tile; Color No.2 for base.
   5. Installation method: Super-Tek Quik-Set mortar bed.
   6. Grout: Versa-Tile Sanded Grout. Color ____

END OF SECTION

SECTION 09330

QUARRY TILE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quarry Tile

B. Crack Isolation.

1.02 RELATED SECTIONS

A. Section 03505 - Self-Leveling Underlayment.

B. Section 07920 - Joint Sealant.

1.03 REFERENCES

A. ANSI A108.10, 1999 - Specifications for Installation of Grout in Tilework.

B. ANSI A118.1, 1999 - Standard Specification for Dry-Set Portland Cement Mortar.

C. ANSI A118.4, 1999 - Latex-Portland Cement Mortar.

D. ANSI A118.5, 1999 - Chemical-Resistant Furan Mortar and Grout.

E. ASTM C50 - Standard Specification for Portland Cement.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Manufacturer’s data sheets on each product to be used.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

D. Selection Samples: Color charts illustrating full range of colors and patterns.

E. Selection Samples: Samples of actual tiles for selection.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility:

1. Obtain each type and color of tile from a single source.

2. Obtain each type and color of mortar, adhesive and grout from the same source.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging until ready for installation.

B. Protect adhesives and liquid additives from freezing or overheating in accordance with manufacturer's instructions.

C. Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during installation of mortar materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Daltile Corporation; 7834 C.F. Hawn Freeway, Dallas, TX 75217. ASD. Tel: (214) 398-1411 or (800) 933-TILE. www.daltileproducts.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 TILE

A. General: Provide tile that complies with ANSI A137.1 for types, compositions and other characteristics indicated. Provide tile in the locations and of the types colors and pattern indicated on the Drawings and identified in the Schedule and the end of this Section. Tile shall also be provided in accordance with the following:

1. Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken from other packages.
2. Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer, unless otherwise specified.
3. Factory Applied Temporary Protective Coatings: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with a continuous film of petroleum paraffin wax applied hot. Do not coat unexposed tile surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall surfaces are free of substances which would impair bonding of setting materials, smooth and flat within tolerances specified in ANSI A137.1, and are ready to receive tile.

B. Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces, and are smooth and flat within tolerances specified in ANSI A137.1.

C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPERATION

A. Protect surrounding work from damage.

B. Remove any curing compounds or other contaminates.

C. Vacuum clean surfaces and damp clean.

D. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

E. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.

F. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION

A. Lay tile to pattern indicated. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2 width is used. Do not interrupt tile pattern through openings.

B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

C. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

D. Form internal angles square and external angles bullnosed.

E. Install ceramic accessories rigidly in prepared openings.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Install thresholds where indicated.

H. Sound tile after setting. Replace hollow sounding units.

I. Keep expansion joints free of adhesive or grout. Apply sealant to joints.

J. Allow tile to set for a minimum of 48 hours prior to grouting.

K. Grout tile joints. Use standard grout unless otherwise indicated.

L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 CLEANING

A. Clean tile and grout surfaces.

3.05 PROTECTION OF FINISHED WORK

A. Do not permit traffic over finished floor surface for 72 hours after installation.

B. Cover floors with kraft paper and protect from dirt or residue from other trades.

C. Where floor will be exposed for prolonged periods cover with plywood or other similar type walkways

END OF SECTION

SECTION 09510

ACOUSTICAL CEILING TILE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabric-faced, composite core acoustical panels.

1.02 RELATED SECTIONS

A. Section 09130 – Acoustical Ceiling Suspension Systems: Suspension system for acoustical panels specified in this section.

B. Section 13925 – Fire Suppression Sprinklers: Sprinkler heads in ceiling.

1.03 REFERENCES

A. ASTM C423 – Sound Absorption and Sound Absorption Coefficients.

B. ASTM C636 – Installation of Metal Ceiling Suspension System for Acoustical Tile.

C. ASTM E84 – Surface Burning Characteristics of Building Materials.

D. ASTM E1264 – Classification for Acoustical Ceiling Products.

E. CISCA (AC) – Acoustical Ceilings: Use and Practice; Ceilings & Interior Systems and Construction Association.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Handle acoustical tiles to avoid soiling exposed surfaces or damaging surfaces and edges.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Sequence work to ensure that acoustical ceilings are not installed until building is enclosed, permanent heating system is available, dust generating activities have terminated, wet works is complete and dry, and work above ceilings is complete.

B. Maintain temperature within 15 degrees Fahrenheit (8 degrees C) and relative humidity within 10 percent of design conditions for spaces of installation not less than 48 hours before installation begins and thereafter.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer of Acoustical Tiles: Illbruck Architectural Products, inc.; 3800 Washington Avenue North, Minneapolis, MN 55412. Tel: (888) 663-4237; Fax (612) 521-5639.

B. Substitutions: Not permitted.

2.02 ACOUSTICAL PANELS

A. Whiteline Ceiling Tiles: Tiles are made of illbruck Architectural Products' exclusive fiber-free wiltec foam. Tiles are Hypalon coated for stain resistance. Contains the properties as follows:

1. Tile Thickness: 1.125 inches (28.5 mm).

2. Tile Size: 12 by 12 inches (305 by 305 mm).

3. Reveal: Tiles configured to maintain reveal of ¼ in (6 mm) between adjacent panels when used in a standard 15/16 inch (8 mm) T-bar grid system.

4. Panel Color: Arctic White

5. Noise Reduction Coefficient (NRC): 1.10, measured in accordance with ASTM C 423.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install ceiling tiles in conjunction with Sections 09130.

B. Install ceiling tiles in accordance with manufacturer's instructions.

3.02 PROTECTION

A. Clean exposed surfaces of acoustical panel ceilings, including suspension system and edge trim. Comply with manufacturer's written instructions for cleaning of minor finish damage.

B. Protect installed products until completion of project.

END OF SECTION

SECTION 09650

Vinyl Composite Tile

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extent of Vinyl Composite Tile Flooring and Accessories is shown on drawings and in schedules.

1.02 RELATED SECTIONS

A. Section 09650 – Vinyl base

B. Section 09650 - Underlayment

1.03 REFERENCES

A. ASTM E84 – Flame Spread.

B. ASTM E84 – Smoke Developed.

C. ASTM E662 – Smoke Density.

D. ASTM E648 – Critical Radiant Flux

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Store vinyl composite tile in space where they will be for at least 48 hours before installation.

D. Install vinyl composite tile and accessories after other finishing operations, including painting have been completed.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain minimum temperatures of 65 degrees F(18 degrees C) in space to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation.

B. Subsequently, maintain minimum temperature of 55 degrees F(13 degrees C) in areas where work is completed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers of vinyl composite tile

1. Armstrong World Industries, Inc, (Excelon)

2. Azrock Floor Products Div, Arzock Industries, Inc. (Architectural Selection)

3. Kentile Floors, Inc. (Architectural Series)

B. Manufacturers of Vinyl Wall Base

1. Armstrong World Industries, Inc, (Excelon)

2. Azrock Floor Products Div, Arzock Industries, Inc.

3. Kentile Floors, Inc.

2.02 TILE FLOORING

A. Vinyl Composition Tile: FS SS-T-312, Type IV; 12”x12” unless otherwise indicated, and as follows:

1. Composition 1 – asbestos-free

2. Gage 1/8”.

2.03 ACCESSORIES

A. Vinyl Wall Base : Provide vinyl wall base complying with FS SS-W-40, Type I, with matching end stops and performed or molded corner units, and as follows:

1. Height: 4”

2. Thickness: 1/8” gage

3. Style: Standard top-set cove for vinyl composite tile and straight base for carpeting

4. Finish: Matte

B. vinyl edge strip : 1/8” thick, homogeneous vinyl or rubber composition, tapered or bull nose edge, color to match flooring, not less than 1” wide

C. Adhesive (Cements): Waterproof, stabilize type as recommended by flooring manufacturer to suit material and substrate conditions.

D. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.

E. Leveling and Patching compounds: Latex type as recommended by flooring manufacturer

PART 3 EXECUTIONS

3.01 INSPECTION

A. Require Installer to inspect sub floor surface to determine that they are satisfactory.

B. Perform bond and moisture tests on concrete sub floors to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compound.

C. Do not allow vinyl composite tile flooring work to proceed until sub floor surfaces are satisfactory.

3.02 PREPATION

A. Prepare sub floor surfaces as follows:

1. Grind the sub floor surface

2. Use leveling and patching compounds for filling small cracks, holes and depression in sub floors

3. Remove coatings from sub floor surface which would prevent adhesive bond

4. Neutralizing Concrete sub floors

B. Broom clean or vacuum surfaces to be covered and inspect sub floor

C. Apply concrete slab primer

3.3 INSTALLATION OF VINYL COMPOSITE TILE

A. Lay tile from center marks. Adjust as necessary to avoid cut widths less than ½ tile at room perimeter. Lay tile square to room axis.

B. Match tiles for color and patterns. Cut tile neatly around all fixtures.

C. Adhere tile flooring to substrate using full spread of adhesive applied.

3.4 CLEANING

A. Sweep or vacuum floor.

B. Do not wash floor until time period has elapsed to allow vinyl flooring to become well-sealed in adhesive.

C. Damp-mop floor being careful to remove black marks and excessive soil.

D. Remove any excess adhesive or other surface blemishes.

3.5 PROTECTION OF FLOORING DURING CONSTRUCTIION

A. Protect vinyl flooring against damage by covering with plywood or hardboard.

B. Cover vinyl flooring with undyed, untreated building paper until inspection for substantial completion.

END OF SECTION 09650

SECTION 09680

CARPET

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet with pad and vinyl base.

1.02 RELATED SECTIONS

A. Section 09250 – Gypsum Board: vinyl base is to be attached to the wall

1.03 REFERENCES

A. ASTM F l869-98 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub floor using Anhydrous Calcium Chloride

B. CRI-104 – Carpet and Rug Institute requirements for installing carpet.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Maintain room temperature and humidity levels before, during and after installation as specified by the manufacturer.

1.05 ENVIRONMENTAL REQUIREMENTS

A. 100% Earth-Friendly P.E.T. Polyester

PART 2 PRODUCTS

2.01 MATERIALS

A. “Prime Choice” Residential Carpet by Empire, Inc. Color: Dusty Sand Rose.

B. Duratech Residential Carpet pad model DTR30 or DTR40

C. Color-Integrated vinyl wall base by Armstrong. Color: Dark Sea Foam.

D. S-725 Adhesive for vinyl wall base.

PART 3 EXECUTION

3.01 INSTALLATION

A. Make sure the floor is dry and free of rubbish. Clean the area to ensure a unsoiled, flat surface for installation

B. Use a saw or shears to cut a length of tackless strip to fit each wall. Nail the strips to the floor around the perimeter of the room, leaving a space between the tackless strip and the wall that equals 2/3 of the thickness of the carpet. Make sure the tackless strips join together at the corners and the pointed pins in each strip are facing the wall.

C. Cut the padding in strips long enough to fit the length of the room. Make sure the padding is long enough to cover the tackless strips on all the walls. Lay out the padding and staple it along its edge every 6 inches. The padding should not overlap; it should be butted up against each other to form a clean seam. Trim the excess padding that is covering the tackless strips, and cover each seam with duct tape.

D. Cut the carpet 4-6 inches longer than the room's dimensions. Overlap the edges of the carpet leaving about 2 inches of excess carpet at the wall. Snap a chalk line on the back of the overlapped carpet edges and trim a straight edge to ensure a straight seam.

E. Trim any excess carpet at each wall. With the blade on an angle and the base of the trimmer flat on the floor, slice the carpet down the wall. At the end of the wall, trim the last few inches with a sharp utility knife.

F. Use a stair tool to push the edges of the carpet between the wall and the tackless strips.

G. Trim the carpet at the doorway, centering the end of the carpet under the shut door. Install a gripper edge or nail in a metal strip to hold the carpet in place.

H. Apply the S-725 Adhesive to the back of the wall base. Stay 1/83 away from the top of the wall base to prevent adhesive oozing. Heat the wall base from the back to help it conform at outside corners.

I. Place wall base into position on the wall. Butt joints neatly and roll with a hand roller towards the previously installed section for a tight fit.

3.02 FIELD QUALITY CONTROL

A. Meet requirements of CRI-104 (Carpet and Rug Institute), Standard for Installation of Commercial Carpet.

B. Moisture Tests: Owner will employ services of an Independent Testing Laboratory (ITL) for testing the moisture content of concrete slabs in accordance with requirements of ASTM F l869-98.

END OF SECTION

SECTION 09720

WALL COVERING

PART 1 GENERAL

1.1 SUMMARY

A. Provide wall covering as shown on the drawings, inferable there from and as specified.

1.2 SUMBITTALS

A. Manufacturer's Data: Submit copies of manufacturer's specifications and installation instructions for all wall covering and accessories required, including certifications and laboratory reports as required to show compliance with the specifications.

B. Samples: Submit samples of wall covering not less then 12 inches square on plywood backing.

C. Contract Closeout Submittals:

Maintenance Data: Include copies of manufacturer's maintenance and cleaning information for each type of wall covering. Include specific recommendations of what kinds of cleaning solutions should be avoided.

1.3 PRODUCT HANDLING

A. Deliver materials in manufacturer's unopened containers fully identified to show name, brand, type, grade and thickness. Store, protect and keep materials dry. Maintain storage space at ambient temperature of not less than 70 degrees Fahrenheit for at least 24 hours prior to installation.

1.4 MAINTENANCE

A. Extra Materials: Upon completion of the work, deliver 2 unopened rolls for each 100 rolls, or fraction thereof, of each type and pattern wall covering installed to a location in the building as directed by the owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. Vinyl Wall Covering: Maximum 0.025 inch thickness with ASTM E84, Class B, flame spread rating less that 50. Color, pattern and texture as selected by the Architect.

2.2 ADHESIVE

A. Manufacturer's recommended adhesive, primer and sealer, manufactured expressly for use with the selected wall covering. Provide materials which are mildew resistant and non-staining to the wall covering.
   1. Vinyl Wall Covering: Provide manufacturer's strippable type adhesive for use with wall covering applied over gypsum drywall. Provide manufacturer's certification that recommended adhesive will permit removal of vinyl wall covering from gypsum drywall surfaces without damage to paper facing.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Condition of Substrate: Examine the substrates and the conditions under which the work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove wall covering materials from its packaging and allow to become acclimatized to the area of installation 24 hours prior to application.

B. Prime substrates with alkyd enamel paint.

3.3 INSTALLATION

A. Vinyl Wall Covering:
   1. Place wall covering panels consecutively in the order they are cut from rolls, including filling spaces above or below openings. Hang by reversing alternate strips except on match patterns.
   2. Apply adhesive to back of wall covering and place in accordance with the manufacturer's instructions. Install seams vertically and plumb, and at least 6 inches away from any corner. Horizontal seams will be permitted only where specifically shown. Place wall covering continuously over internal and external corners. Overlap seams and double-cut to assure tight closure. Roll, brush or use broad knife to remove air bubbles, wrinkles, blisters and other defects. Cut wall covering evenly to the edges of the outlet boxes or supports.

B. Trim selvages as required to assure color uniformity and pattern match at seams.

C. Remove excess adhesive along finished seams using warm water and a clean sponge and wipe dry.

3.4 CLEANING

A. Immediately after the installation is completed, thoroughly clean and remove adhesive spots with a damp cloth. Remove all droppings, trimmings and other debris and protect the installation so that it will be clean and without and indication of damage at the time of acceptance by the owner.

3.5 INSPECTION

A. 4 months after acceptance of substantial completion, return and inspect all work with the owner. Repair peeling edges, corners and seams.

SECTION 099123

FINISH PAINT FOR HM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water-based two-component polyurethane-fortified finish paint system.

B. Surface preparation.

1.02 RELATED SECTIONS

A. Section 08110 – Steel doors and frames.

1.03 REFERENCES

A. ASTM D1308 – Chemical Exposure Testing

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Deliver materials in unopened containers with manufacturer's label intact.

D. Protect materials from freezing.

E. Store Between 50 and 80 degrees Fahrenheit.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC requirements.

B. Maintain materials and surrounding air temperature to minimum 15 degrees C (50 degrees F) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Master Coating Technologies (MCT). Telephone: (800) 898-0219

2.02 MATERIALS

A. Finish System Components:

1. Water-based two-component polyurethane-fortified coating and crosslinker

2. Miscellaneous Materials: Surface bonding compounds and other substituting paints should be high quality and compatible with coating systems.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready to receive work of this Section and are in a condition that is in accordance with manufacturer's requirements.

B. Beginning application of materials signifies acceptance of substrates.

3.02 PREPARTION

A. Protection: Mask adjacent surfaces to protect from spray. Protect windows and floors with drop cloth.

B. Remove objects that are not to be coated from room. Store in safe place until ready for reinsertion.

C. Patch and repair substrates: Clean dirt, grit, oil, grease, coatings or other foreign substances from surfaces to be painted.

3.03 APPLICATION

A. Applicator to apply coats in accordance with manufacturer's specifications.

3.04 INSPECTION

A. Request acceptance of each coat before applying succeeding coats.

B. Touch up and repair unacceptable work.

C. Protect finished areas from damage.

3.05 CLEANING

A. Clean over sprays and spills. Remove masking.

B. Repair damages to coatings and surfaces caused by clean-up activities.

END OF SECTION

SECTION 09910

PAINTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish paint for gypsum board

1.02 RELATED SECTIONS

A. Section 09910 – Interior Paint

1.03 REFERENCES

A. ASTM – Paint Finishes

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01650.

B. Store and protect products under provisions of Section 01520.

C. Protect paint from drying out.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Dispose of properly when finished.

B. Maintain materials and surrounding air temperature.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pittsburgh Paints Builder's Spec #8482 (57-647)

1. Vinyl Acrylic Latex paint.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install paint following section 01730.

END OF SECTION

SECTION 09960

Primer Paint

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water-based two-component polyurethane-fortified paint finish system.

B. Surface Preparation.

1.02 RELATED SECTIONS

A. Section 08110 – Steel Doors & Frames.

1.03 PERFORMANCE

A. VOC: Coatings shall have less than 150 g/L of volatile organic compounds.

B. Fire Rating: Coatings shall be Type I or Class A fire rated. ASTM E-84-91a

C. Scrub Test: >2,800 cycles. ASTM D2486

D. Impact Resistance: >60 in/lbs. ASTM D2794

E. Chemical Resistance: "10" (test maximum) for all chemicals tested. ASTM D1308

F. Finish: 10-15% gloss at 60 degrees.

G. Stain Removal: "8"—"10" (test maximum) for all stains tested. Four-hour Open Spot Test.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Submit manufacturer's product data and installation instructions.

1.05 DELIVERY, STORAGE, HANDLING

A. Comply with Section 01600.

B. Deliver materials in unopened containers with manufacturer's labels intact.

C. Protect materials from freezing.

D. Store between 50 and 80 degrees F.

1.06 PROJECT CONDITIONS

A. Apply Coatings only under the following conditions:

1. Air Temperature: Between 50 and 80 degrees F. Relative humidity: less than 50%.

2. Prevent wide temperature fluctuations that could cause moisture condensation on freshly coated surfaces.

3. Application Areas free of excessive dust.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Master Coating Technologies (MCT). Telephone: (800) 898-0219.

B. Substitutions: Under provisions of Section 01600.

1. Submit proposed substitution to Architect no fewer than 10 days before bid date. Acceptance will be by Addendum.

2.02 MATERIALS

A. Primer: Provide primer recommended by manufacturer of substrate

.1. Unprimed metals: Depends on metal type. Call MCT at (800) 898-0219.

2.03 EQUIPMENT

A. Spray on roll primers and base coats in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready to receive work of this Section and are in a condition that is in accordance with manufacturer's requirements.

B. Beginning application of materials signifies acceptance of substrates.

3.02 PREPARATION

A. Protection: Mask adjacent surfaces to protect from over-spray. Protect floors and other surfaces with drop clothes.

B. Remove items which are not to be coated from surfaces that are to be coated. Tag and protect removed items and store until reinstallation.

C. Patch and repair substrates as specified in applicable Specifications Sections. Clean substrates: remove dirt, grit, loose materials, grease, oil, temporary protective coatings, contamination, and other foreign materials. Sand with 100 grit or finer sand paper, spackle, putty and caulk existing surfaces to produce smooth and uniform substrates.

3.03 APPLICATION

A. Apply as many coats as necessary to produce a uniform substrate appearance. Do not exceed manufacturer's recommended coverage rate. Allow to dry prior to application of subsequent coats.

B. Re-prime suction and hot spots on substrate prior to applying base coatings.

C. Sand primer with 100 grit or finer sand paper. Thouroughly remove dust from sanding with a clean, wet rag.

END OF SECTION

SECTION 10810

TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial quality toilet acessories.

1.02 RELATED SECTIONS

A. Section 06100 – Rough Carpentry: Rough blocking.

B. Section 08800 – Glass and Glazing: Unframed mirrors.

C. Section 09250 – Gypsum Drywall: Concealed blocking.

1.03 REFERENCES

A. ASTM A527, G60 – Galvanized Sheet Steel.

B. ASTM B456 – Chromium Plating.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in unopened factory labeled packages.

B. Store products in compliance with manufacturer's instructions. Protect from damage.

C. Minimize on-site storage.

PART 2 PRODUCTS

2.01 MATERIALS

A. Stainless Steel: AISI type 302/304, with NAAMM no. 4 satin finish, 22 gage minimum.

B. Galvanized Sheet Steel: ASTM A527, G60.

C. Chromium Plating: Nickel and chromium electro-deposited on base metal of steel or brass, ASTM B456, type SC2.

D. Fasteners: Where exposed, provide fasteners finished to match accessory.

2.02 FABRICATION

A. Fabricate accessories to be truly straight, plumb, level, and square with uniform, tight joints and smooth and rounded edges.

B. Provide anchorage arrangement which is fully concealed when unit is closed.

C. Provide continuous stainless steel piano hinges for all accessories that open.

PART 3 EXECUTION

3.01 INSTALLATION

A. Strictly comply with manufacturer's instructions.

B. Securely install at heights and locations indicated.

3.02 ADJUSTING, CLEANING, PROTECTION

A. Adjust operating parts to work easily, smoothly, and correctly.

B. Repair minor damage to eliminate all evidence of repair.

C. Provide temporary protection to ensure work being without damage. Reclean as necessary.

END OF SECTION

SECTION 11450

KITCHEN EXHAUST HOOD

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Two-Speed Range Hood (Ducted vertically or horizontally to outside) with Rocker-Type Fan and Light Switches and Back Draft Damper. Mounted to Recessed Bottom Cabinet

1.02 RELATED SECTIONS

A. Section 12350 – Kitchen Cabinet: Mounted to Recessed Bottom.

B. Section 15810 – Metal Ductwork: Ventilation System.

1.03 REFERENCES

A. HVI 2100 – Mechanical Ventilation.

B. HUD/FHA Minimum Property Standard for Mechanical Ventilation Compliant

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

PART 2 PRODUCTS

2.01 MATERIALS

A. Polymeric Blade and Light Lens

B. Washable Aluminum Filter

2.02 REQUIREMENTS

A. Unit shall have backdraft damper and be ducted to the outside.

B. Motor shall be permanently lubricated. RPM not to exceed 2795.

C. Unit shall have a two-speed fan switch and separate light switch.

D. Sides shall be mitered and bottom edge hemmed – no sharp edges.

E. Air delivery shall be no less than 160 CFM

F. Sound levels shall be no greater than 6.5 sones horizontally and vertically.

G. Unit shall be UL listed.

2.03 MANUFACTURER

A. NuTone, Inc.

Madison and Red Bank Roads

Cincinnati, OH 45227

(888)-336-6151

B. Requests to use equivalent products from other manufacturers shall be submitted in accordance with Section 01630 – Product Substitution Procedure.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install according to manufacturer's instructions and approved shop drawings.

1. Sufficient air is needed for proper exhausting of gases to prevent backdrafting.

2. Ducted fans must be vented to the outdoors.

3. Use only metal duct work to reduce the risk of fire.

4. Install duct work so that it is flush to the range hood's mounting surface

B. Mount 24" to 30" above the cooking surface.

C. Mount to bottom of standard wall cabinet.

3.02 FIELD QUALITY CONTROL

A. Field testing will be performed in order to observe proper use and installation.

1. Check operation of fan and light.

2. Use a long blade screwdriver to reach into the discharge opening to be certain the damper operates freely

3. Check that hood is at least 24" above stove.

END OF SECTION

SECTION 12350

KITCHEN CABINETS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings should

1.02 SUMMARY

A. This section includes the following

1. Wood-faced kitchen cabinets

B. Related Sections include

1. Division 6 Section “Interior Architectural Woodwork” for countertops mounted on kitchen cabinets.

2. Division 15 Section “Plumbing Fixtures” for sink units mounted on countertops.

1.03 DEFINITIONS

A. Exposed Surface of Casework: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.

B. Semiexposed Surfaces of Casework: Surfaces behind opaque doors or drawer fronts, including interior faces of doors and interiors and sides of drawers. Bottoms of wall cabinets are defined as “semiexposed.”

C. Concealed Surfaces of Casework: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, and ends of cabinets installed directly against and completely concealed by walls or other cabinets. Tops of wall cabinets and utility cabinets are defined as “concealed.”

D. ASTM C270 – Mortar for Unit Masonry

E. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.04 SUBMITTALS

A. Product Data: For the following:

1. Cabinets

2. Cabinet Hardware

B. Shop Drawings; For cabinets and countertops. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles, cutouts for plumbing fixtures, and methods of joining countertops.

C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material exposed to view.

D. Samples for Verification: For the following materials; in sets showing the full range of color, texture, and pattern variations expected.

1. Wood-veneered panels with transparent finish, 8 by 10 inches, for each species.

2. Solid wood with transparent finish, 50 sq. in., for each species.

3. One unit of each type of exposed hardware.

E. Product Certificates: Signed by manufacturers of casework certifying that products furnished comply with requirements.

1.05 QUALITY ASSURANCE

A. Source Limitations for Cabinets: Obtain cabinets through one source form a single manufacturer.

B. Product Designations: Drawings indicate size, configurations, and finish material of casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes, similar door and drawer configurations, same finish material, and complying with the Specifications may be considered prior to receipt of the final GMP. Refer to Division 1 Section "Substitutions."

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install kitchen casework until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Established Dimensions: Where kitchen casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.

C. Field Measurements: Where kitchen casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes if necessary.

1.07 COORDINATION

A. Coordinate layout and installation of blocking and reinforcement in partitions for support of kitchen casework.

PART 2 PRODUCTS

2.01 MANUFACTURES

A. Products: Subject to compliance with requirements, provide the following:

1. Pennington Square, Wheat Oak finish – Yorktowne Premier Collection.

2.02 CABINET MATERIALS

A. Exposed Materials: Comply with the following:

1. Exposed Wood Species: As follows. Do not use two adjacent exposed faces that are noticeably dissimilar in color, grain, figure, or natural character markings.

a. Hard maple.

B. Semiexposed Materials: as standard with products specified above.

2.03 CASEWORK HARDWARE

A. General: Manufacturer's standard units complying with BHMA A156.9, of type, material, size, and finish as selected from manufacturer's standard choices.

B. Hinges: Concealed European-style hinges.

C. Pulls: Yorktowne No. 76373-3, polished brass.

D. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05091.

2.04 CABINET CONSTRUCTION

A. Provide cabinet construction and finishes as standard with products specified above.

B. Exposed Cabinet Ends: Veneer-faced plywood.

C. Exposed cabinet backs and islands: Veneer-faced plywood.

D. Factory Finishing: To greatest extent possible, finish casework at factory. Defer only final touchup until after installation.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install casework with no variations in flushness of adjoining surfaces; use concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.

B. Install casework without distortion so doors and drawers fit openings and are aligned. Complete installation of hardware and accessories as indicated.

C. Install casework and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.

D. Fasten Cabinets to adjacent units and to backing.

1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood blocking.

E. Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with glue and concealed clamping devices designed for this purpose.

F. Fasten solid-surfacing-material countertops by screwing through corner blocks of base units into underside of countertop. Align adjacent surfaces, and form seams to comply with manufacturer's written instructions using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.02 ADJUSTING AND CLEANING

A. Adjust casework and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

B. Clean casework on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 12352
RESIDENTIAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Fixed modular laminate clad casework and components.
- B. Flexible rail mounted laminate clad casework and components.
- C. Countertops.
- D. Mobile storage units, tables and components.

1.02 RELATED SECTIONS
- A. Blocking within walls where indicated: Division 6.
- B. Millwork, trim, and custom cabinetry: Division 6.
- C. Locks master keyed to room doors: Division 8.
- D. Glass: Division 8.
- E. Base molding: Division 9.
- F. Hoods and ducting within or adjacent to casework: Division 11.
- G. Appliances: Division 11.
- H. Sinks and service fixtures, service waste lines, connections, and vents: Division 15.
- I. Electrical service fixtures: Division 16.

1.03 DEFINITIONS
- A. Identification of casework components and related products by surface visibility.
  - 1. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass insert doors and/or acrylic doors.
  - 2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts, sliding solid doors.
  - 3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
  - 4. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
  - 5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
  - 6. Concealed Surfaces: Any surface not visible after installation.

1.04 QUALITY ASSURANCE
- A. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.
- B. Manufacturer: Provide products certified as meeting or exceeding ANSI-A 161.1-1998 testing standards.

1.05 SUBMITTALS
- A. Comply with Section 01330, unless otherwise indicated.

B. Product Data: Manufacturer's catalog with specifications and construction details.

C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.

1. Include section drawings of typical and special casework, work surfaces and accessories.
2. Indicate locations of plumbing and electrical service field connection by others.

D. Casework Samples:

1. Base cabinet: Cabinet conforming to specifications, with drawer and door.
2. Wall cabinet: Cabinet conforming to specifications, with door.
3. Cabinet samples shall be complete with specified hardware for doors, drawers and shelves.
4. Component samples: Two sets of samples for each of the following:
   a. Decorative laminate color charts.
   b. PVC and ABS edgings.

1.06 PRODUCT HANDLING

A. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 20 percent to 50 percent.

B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 JOB CONDITIONS

A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.

1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.

B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 WARRANTY

A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Manufacturers shall comply with the minimum levels of material and detailing indicated on the drawings or as specified.

2.02 MATERIALS

A. Core Materials:

1. Particleboard up to 7/8 inch thick: Industrial Grade average 47-pound density particleboard, ANSI A 208.1-1999, M-3.
2. Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particle-board, ANSI A 208.1-1999, M-2.
3. Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2.

B. Decorative Laminates:
1. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2000.
2. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2000.
3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2000.
4. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2000.
5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2000.
6. Thermally fused melamine laminate, NEMA Test LD 3-2000.

C. Laminate Color Selection: Maximum 1 color per unit face and 5 colors per project. (See Color Selection in section 3.05).

D. Edging Materials:
1. 1mm PVC banding.
2. 3mm PVC banding, machine profiled to 1/8 inch radius.

E. Glass:
1. Wall unit full sliding glass doors: 1/4 inch thick plate glass.
2. Glass insert doors, hinged or sliding wall cabinets: 1/4 inch thick laminated safety glass.
3. Glass insert doors, hinged or sliding tall or base cabinets. 1/4 inch thick laminate safety glass.
4. Sliding doors mounted in aluminum track.
5. Trim glass inserts: Extruded rigid PVC channel and self-locking insert retainer strip.

2.03 SPECIALTY ITEMS

A. Support Members:
1. Countertop support brackets: Epoxy powder coated black, 11 gauge steel with integral cleat mount opening.
2. Undercounter support frames: Epoxy powder coated.
3. Legs: Epoxy powder coated.

B. Tote Trays:
1. Heavy-duty vacuum-formed polypropylene plastic with full top rim and pull. Trays are ivory color, equipped with label holder.
2. Tote tray/supply cabinets equipped with injection molded polycarbonate; continuous side rail support glide. Each side rail support glide is adjustable with integral support pins to interface 32mm pre-drilled holes.

C. Mobile Storage Units:
1. Tall mobile storage units, as indicated on the drawings, are structural steel framed with epoxy powder coated tubing.
2. Casters: 5 inch soft rubber double ball bearing, heavy gauge steel fork, zinc plate finish with 2 brakes per unit. Load capacity per caster to be a minimum of 200 pounds.

3. Side panels, back, top, drawer fronts, and doors are of 3/4 inch thick particleboard, laminated on the exterior with high pressure decorative laminate VGS and on the interior with high pressure CLS cabinet liner. Exposed edges are PVC banding, 1mm or 3mm thickness, to match adjacent casework.
4. Low mobile storage units are mounted to a caster base.

D. Computer Keyboard Tray:
1. Non-articulating, undercounter mount with positive stop drawer slides.

E. Music Specialty/Heavy Duty Storage Units:
1. Instrument and uniform storage unit: Exposed exterior finished ends are VGS laminate balanced on interior surface with CLS cabinet liner. Unexposed End panels and vertical dividers are thermally fused melamine laminates, both faces, with matching 3mm PVC front edging. Cabinet backs are 1/2 inch thick particleboard core laminated with thermally fused melamine laminate.
2. Instrument shelves: 3/4 inch thick particleboard core laminated both faces with thermally fused melamine laminate. Shelves are doweled into sides. Top surface is molded flat stock heavy-duty polyethylene with textured abrasion-resistant finish permanently bonded to shelf. Front of shelf edged with machine applied 3mm PVC edge banding matching heavy-duty polyethylene.
3. Wire grille doors: Heavy gauge rod welded to 3/16 inch diameter verticals; 2-3/4 inch, hospital tip, 0.095 inch thick steel, five knuckle hinges welded to door. Padlock eyelets included.
4. Solid doors: 3/4 inch thick particleboard core laminated with VGS laminate on the exposed surface and balanced with CLS cabinet liner on the interior surface. 3mm PVC edged doors and five knuckle, 2-3/4 inch, hospital tip, 0.095 inch thick steel epoxy powder coated hinges. Padlock eyelets included.

F. Catheter Shelf:
1. Particleboard core with melamine laminate. Continuous label holder front edge and 3mm edgebanding. Bottom of shelf shall accommodate pullout carriers for catheter storage.
2. Provide 7 catheter hooks per carrier on 24 inch deep cabinet.
3. Hooks: 3/16 inch black epoxy powder cold rolled steel.

G. Pharmacy Units:
1. Pharmacy units: Furnish as indicated on drawings.
   a. Base units:
      1) Single faced configuration.
      2) Adjustable shelving.
      3) Sloped adjustable shelves with gravity trays.
   b. Wall units:
      1) Adjustable shelving.
      2) Sloped adjustable shelves with gravity trays.
   c. Tall units:
      1) Single faced configuration.
      2) Adjustable shelving.
      3) Sloped adjustable shelves with gravity trays.
      4) Double faced configuration.

d. Install sloped shelves with KV #80 standards and KV #179 adjustable shelf brackets. Sloped shelves are 3/4 inch or 1 inch thick core with finish matching open interior selection. Edge shelves with 3mm PVC lip at the front.

e. Gravity trays are heavy-duty vacuum-formed polypropylene plastic with removable dividers.
1) 6-3/4 inch x 2-1/2 inch x 9-1/4 inch with one removable divider.
2) 6-3/4 inch x 2-1/3 inch x 20-1/4 inch with two removable dividers.

2.04 CABINET HARDWARE

A. Hinges:

1. Five knuckle, epoxy powder coated, institutional grade, 2-3/4 inch overlay type with hospital tip. 0.095 inch thick. ANSI-BHMA standard A156.9, Grade 1.

a. Doors 48 inches and over in height have 3 hinges per door.

b. Magnetic door catch with maximum 5 pound pull provided, attached with screws and slotted for adjustment.

B. Pulls:

1. Door and drawer front pulls, are epoxy powder coated metal wire, 96mm spacing on screws. Pull design shall comply with the Americans with Disability Act (ADA).

C. Drawer Slides:

1. Regular, kneespace and pencil: 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, 150-pound load rated epoxy coated steel slides.

2. File: Full extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.

D. Adjustable Shelf Supports:

1. Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32mm centers. Each shelf support has 2 integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The support automatically adapts to 3/4 inch or 1 inch thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.

E. Locks:

1. Removable core, disc tumbler, cam style lock with strike. Lock for sliding 3/4 inch thick doors is a disc type plunger lock, sliding door type with strike. Lock for sliding glass/acrylic doors is a ratchet type sliding showcase lock.

2. Elbow catch or chain bolt used to secure inactive door on all locked cabinets.

F. Sliding Door Track: Anodized aluminum double channel.

G. Coat Rods: 1 inch diameter, 14-gauge chrome plated steel installed in captive mounting hardware.

H. File Suspension System: Extruded molding integral with top of drawer box sides to accept standard hanging file folders.

I. Mirrors: 1/4 inch thick polished mirror plate.

2.05 FABRICATION:

A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.

B. Cabinet Body Construction:

1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets.
   a. Tops, bottoms and sides of all cabinets are particleboard core.
2. Cabinet backs: 1/2 inch thick particleboard core.
   a. Exposed back on fixed or movable cabinets: 3/4 inch thick particleboard with the exterior surface finished in VGS laminate as selected.
   b. Flexible rail mounted cabinet backs: 3/4 inch thick particleboard structurally doweled into cabinet sides and top panels.
3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick particleboard. Base is 96mm (nominal 4 inch) high unless otherwise indicated on the drawings.
4. Base units, except sink base units: Full sub-top. Sink base units are provided with open top and a particleboard stretcher at the front, doweled and glued to the sides, laminated with VGS color to match faces, balanced with CLS. Back to be split removable access panel.
5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
6. Exposed and semi exposed edges.
   a. Edging: 1mm PVC.
7. Adjustable shelf core: 3/4 inch thick particleboard up to 36 inches wide, 1 inch thick particleboard over 36 inches wide.
   a. Front edge: 1mm PVC.
8. Interior finish, units with open Interiors:
   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate with matching prefinished back.
9. Interior finish, units with closed Interiors:
   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate with matching prefinished back.
10. Exposed ends:
    a. Faced with VGS high-pressure decorative laminate.
11. Wall unit bottom:
    a. Faced with thermally fused melamine laminate.
12. <u>Balanced construction of all laminated panels is mandatory</u>. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.

C. Drawers:

1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with thermally fused melamine doweled and glued into sides. Top edge banded with 1mm PVC.
2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with thermally fused melamine, screwed directly to the bottom edges of drawer box.
3. Paper storage drawers: Minimum 3/4 inch thick particleboard sides, back, and sub front laminated with thermally fused melamine. Minimum 1/2 inch thick particleboard drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.

D. Door/Drawer Fronts:
1. Core: 3/4 inch thick particleboard.
2. Provide double doors in opening in excess of 24 inches wide.
3. Faces:
   a. Exterior: VGS High-pressure decorative laminate.
   b. Interior: High-pressure cabinet liner CLS.
2. Door/drawer edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

E. Miscellaneous Shelving:
1. Core material: 3/4 inch or 1 inch thick particleboard.
2 Exterior: VGS High-pressure decorative laminate.
3. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

2.06 DECORATIVE LAMINATE COUNTERTOPS:
Core: 1 inch thick ANSI A208.1-1993 M-2 particleboard.
Surface: HGS/HGP high-pressure decorative laminate with balanced backer sheeting.
Edges, including applied backsplash: 3mm PVC, exposed edges and corners machine profiled to 1/8 inch radius. Edges are machine applied with water based low Volatile Organic Compound (VOC), non-toxic, PVA adhesive.

2.07 HEAVY DUTY TABLES:
Work tops: 1 inch thick particleboard core laminated top surface with HGS/HGP laminate, balanced with backer sheeting.
Edges: 3mm PVC
Work top support frame: Furniture grade, epoxy powder coated steel.
Under table storage units: Manufacturer’s flexible rail mounted undercounter units adapted for installation to work top support frame.
Adjustable legs: 1-3/4 inch x 1-3/4 inch x 14 gauge epoxy powder coated tubing fitted inside 2 inch x 2 inch x 14 gauge with height adjustment. Heavy-duty, non-marking adjustable floor glides.

2.08 UTILITY CHASE SYSTEM
Flexible rail utility chase frames: Internal epoxy powder coated steel frame assembly pre-drilled to accept other system components. Dimensionally integrated to align with and accommodate fixed modular or flexible rail-mounted casework and countertops.
Flexible rail mounted casework support rail and interfacing support keys: Extruded aluminum 6061-T6 alloy, epoxy powder coated, concealed structural fasteners secured through portion of closure panel one or both sides as required.
Chase access panels: 3/4 inch thick with 1mm PVC edges, thermally fused melamine laminate faces both sides.

Wing walls: 1 inch thick particleboard with high-pressure decorative laminate VGS both sides, 3mm PVC edges, two levelers on bottom edge.
Reagent ledges and over-chase shelving: 1 inch thick particleboard with 3mm PVC edges; provide laminate surfaces as indicated.

2.09 CHALK, TACK, MARKERBOARD, ETC.
Instructional/Display Surfaces:
Relocatable chalkboards, markerboards, and tackboards. Dimensionally integrated to align with fixed modular or flexible rail mounted casework.
Support system: Extruded aluminum, 6061-T6 alloy, support keys securely mounted through continuous galvanized mounting strips on back of unit. Units over 13 inch high have 2 pair of support keys 5 modules apart vertically to allow height adjustment. Support keys interface horizontal support rail.
Stand-off extrusion is provided on each unit to hold vertical surface parallel to wall surface.
Chalkboard and markerboard: Porcelain enamel on steel, minimum 26 gauge, laminated to 3/4 inch thick particleboard core using water-proof adhesives.
Tackboard: 1/4 inch thick tac-tex vinyl impregnated cork laminated to 1/2 inch thick particleboard core using water-proof adhesives.
Back surface sealed with 0.015 aluminum moisture barrier. Radius corners 2 inches. Edges finished with PVC with custom overhang lip.
Stiffen boards to minimize flexing.

PART 3 EXECUTION
3.01 INSPECTION:
The casework contractor must examine the job site and the conditions under which the work under this section is to be performed, and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION:
Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION:
Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
Repair minor damage per plastic laminate manufacturer’s recommendations.

3.04 CLEANING:
Remove and dispose of all packing materials and related construction debris.
Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

3.05 COLOR SELECTION:
Laminate Color Selection:
Select from the full range of Wilsonart® stock color charts for cabinet faces, exposed ends, open interiors, and countertops. Note: Color charts are found in the Ordering and Specifying section of the TMI catalog.
Thermally fused melamine laminate matched to Wilsonart® Frosty White color.
Hinge and Pull Color Selection:

Select from your choice of stock colors (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Slate Grey, Black and Chrome. Other colors are available. Special order colors may impact cost and lead times.

Miscellaneous Hardware Color Selection (support brackets, table frames, rail):

Select from your choice of stock colors (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Slate Grey and Black.

1mm PVC Edge Banding Color Selection:

Select from your choice of many 1mm PVC edgings available in a variety of solid, pattern and woodgrains matching laminate colors*. Special order colors may impact cost and lead times.

3mm PVC Edge Banding Color Selection:

Select from your choice of 3mm PVC stock colors (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Slate Grey, Black. Other colors are available*. Special order colors may impact cost and lead times.

----------END OF SECTION----------

SECTION 15410

PLUMBING PIPING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. This section includes plumbing pipe systems, serving the building areas, extending and connecting to existing on site and building utilities. Systems include the following:

1. Potable domestic water distribution, including cold-and hot-water supply piping systems.

2. Sanitary drainage, waste and vent piping systems.

3. Storm drainage piping systems.

4. Foundation/footing drain piping systems.

5. Sump pump discharge piping.

6. Natural gas piping systems.

7. Engine exhaust piping.

8. Valves.

9. Regulators.

10. Disinfection of domestic water piping system.

11. Service connections.

1.03 RELATED WORK:

A. Section 15010 Plumbing General Provisions
B. Section 15022 Excavation, Trenching, and Backfilling
C. Section 15140 Supports, Anchors, Sleeves and Seals
D. Section 15190 Piping and Equipment Identification
E. Section 15260 Piping Installation
F. Section 15430 Plumbing Specialties
G. Section 15440 Plumbing Fixtures
H. Section 15450 Plumbing Equipment

1.05 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with the following minimum working pressure ratings:

1. Water Distribution Systems, Above Ground: 125 psig.

2. Soil, Waste, and Vent Systems: 10-foot head of water.

3. Natural gas piping systems: 90 psig.

1.06 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification.

B. Water samples, test results, and results.

C. Product data for each piping system and valve specified.

1.07 QUALITY ASSURANCE

A. Comply with the provisions of ASME B31.9 “Building Services Piping” for materials, products, and installation.

B. Provide listing/approval stamp, label, or other marking on piping made to specified standards.

C. Valves. Manufacturer’s name and pressure rating marked on valve body.

D. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

E. Welders Certification: In accordance with ASME Sec. 9.

PART 2 PRODUCTS

2.01 SANITARY SEWER PIPING, BURIED BEYOND 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74, service weight.

1. Fittings: Cast Iron.

2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets.

B. PVC Pipe: ASTM D3033 or D3034, SDR 35.

1. Fittings: PVC

2. Joints: ASTM F477, elastomeric gaskets,

2.02 SANITARY SEWER AND VENT PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74, service weight,

1. Fittings: Cast Iron.

2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets.

B. Cast Iron Pipe: CISPI 301, hubless, service weight.

1. Fittings: Cast Iron.

2. Joins: Cast iron housing with (heavy duty) stainless steel bolts and neoprene gaskets.

C. PVC Pipe: ASTM D2729

1. Fittings: PVC

2. Joints: ASTM D2855, solvent weld

2.03 SANITARY SEWER AND VENT PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.

1. Fittings: Cast iron.

2. Joints: Neoprene gaskets and (heavy duty) stainless steel clamp and shield assemblies.

B. Copper Tubing: ASTM B306, DWV.

1. Fittings: ASTM B16.29, wrought copper.

2. Joints: ASTM B32, solder, Grade Sn95.

2.04 WATERING PIPING, UNDERGROUND

A. Cast Iron Pipe: AWWA C151, Class 52, double cement lined, coated.

1. Fittings: AWWA C153/A21.53, Class 54, compact ductile iron, coated rated at 350 psi, manufactured by U.S. Pipe or Tyler Pipe.

2. Joints: AWWA C111/A21.11, mechanical joint with gland, neoprene gaskets, ¾” x 3-1/2” bolts with nuts.

2.05 WATER PIPING, ABOVE GRADE

A. PVC Pipe: ASTM D3033 or D3034, perforated, SDR35.

1. Fittings: PVC

2. Joints: ASTM F477, elasomeric gaskets.

B. Corrugated Perforated Polyethylene Pipe: ASTM F405.

1. Fittings: Corrugated Polyethylene.

2. Joints: Twist-on.

3. Manufacturer: Hancor, Inc.

2.07 STORM WATER PIPING, BURED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: CISPI 301, hubless, service weight.

1. Fittings: Cast iron.

2. Joints: Cast iron housing with stainless steel bolts and neoprene gaskets.

2.08 STORM WATER PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.

1. Fittings: Cast iron.

2. Joints: Neoprene gaskets and (heavy duty) stainless steel clamp-and-shield assemblies.

2.09 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53 or A120, Schedule 40 black.

1. Fittings: ASME B16.3, malleable iron, or ASTM A234, forged steel welding type.

2. Joints: Screwed for pipe two inches and under: AWS D1.1, welded, for pipe over two inches.

3. Casing: Same as pipe fittings.

2.10 ENGINE EXHAUST PIPING

A. Steel Pipe: ASTM A53 or A120, Schedule 80 black.

1. Fittings: ASTM A234, forged steel long radius welding type.

2. Joints: AWS D1.1, welded.

2.11 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches and Under

1. Ferrous Pipe: 150 psig malleable iron threaded unions.

2. Copper tube and pipe: 150 psig bronze unions with soldered joints.

B. Pipe Size Over 2 Inches

1. Ferrous Pipe: 150 psig forged steel slip-on flanges; 1/16 inch thick performed neoprene gaskets.

2. Copper tube and pipe: 150 psig slip-on bronze flanges; 1/16 inch thick performed neoprene gaskets.

C. Grooved and Shouldered Pipe End Couplings

1. Housing: ASTM A536 Ductile iron clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion, steel bolts, nuts, and washers, galvanized pipe.

2. Sealing gasket: "C" shape composition sealing gasket.

3. Acceptable Manufacturers: Victaulic, Gustin-Bacon, Grinnell.

D. Mechanically formed tee connections for hard temper copper tubing.

1. Mechanically extracted collars shall be formed in a continuous operation consisting of drilling a pilot hole and drawing out the tube surface to form a collar having a height of not less than three times the thickness of the tube wall. The collaring device shall be fully adjustable as to insure proper tolerance and complete uniformity of the joint. The join branch tube shall be notched and dimpled in a single process so as to set the proper penetration of the branch tube into the fitting to assure a free flow joint. All joints shall be braced in accordance with the copper Development Association Copper Tube Handbook using B-cup series filler metal. Note: collars shall be approved by the National Standard Plumbing Code, B.O.C.A., I.A.M.P.O., S.B.C.C.

E. Transition Joints

1. All transition joints in sewers between similar or dissimilar materials of equal or unequal size shall be made water and gas tight by means of approved connector or adapter of the compression or mechanical seal type. The connector or adapter shall be manufactured of preformed elastomeric plastic conforming to the applicable sections of ASTM standards C-443, C-425, C-564, and D-1869. Couplings of the mechanical seal type shall have tightening clamps or devices made of series 300 stainless steel. The compression joint connector or adapter and flexible coupling shall be

installed as recommended and specified by the manufacturer, and each connector shall bear the manufacturer's name clearly visible when installed as manufactured by Fernco, Inc., Davison, Michigan, or approved equal.

2.12 GATE VALVES, UNDERGROUND

A. Over 2 inches for Domestic Water: Iron body, ASTM A125 Class B, bronze mounted, AWWA 200 psi WWP, mechanical joint [Tyton joint] ends, resilient wedge, AWWA C550 epoxy coating inside and out, non-rising stem, mounting plate, cast iron curb box and cover.

B. 4 inches to 16 inches for Domestic Water: Ductile iron body, Class 250, bronze mounted, AWWA 250 psi WWP, mechanical joint ends, resilient edge, AWWA C550 epoxy coated inside and out, non-rising stem, mounting plate, cast iron curb box and cover.

C. Acceptable Manufacturers – Gate Valves, Underground

Manufacturer	**Model**
Kennedy	1571X
Muellar	A-2370-20
Stockhma	G-701-0
U.S. Pipe	Metroseal (or Metroseal 250)

2.13 BALL VALVES

A. Up to 3 inches: Bronze two piece body, 800 psi WOG, chrome plated bronze bell, convention port, Teflon seats and stuffing box ring, lever handle, threaded ends.

B. Acceptable Manufacturers – Ball Valves

Manufacturer	**Model**
Apollo	70-100
Nibco	T-585-70
Stockham	S-216-BR-RT
Watts	B-8000
Grinnell	171 N

2.14 BUTTERFLY VALVES

A. Over 2 inches: Iron body ASTM A126 or A395, Class 200, for dead-end service, aluminum bronze disc, replaceable EPDM seat for service to 180 degrees F, lug ends, stainless steel stem, infinite position lever handle on sizes through 6 inches, hand wheel and gear operator on sizes 8 inches and larger.

B. Acceptable Manufacturers – Butterfly Valves

Manufacturer	Lever	Gear
Center-Line	Series LT	Series LT W/Gear
Grinnell	LC-1261-3	LC-1282-3
Nibco	LD-2000-3	LD-2000-5
Stockham	LD-712-BS3-E	LD-722-BS3-E
Watts	BF-03-121-11	BF-03-121-12

2.15 SWING CHECK VALVES

A. Up to 2 inches: Bronze body, ASTM B62, Class 125, bronze swing disc, screwed ends

B. Over 2 inches: Iron body ASTM A126 Class B, Class 125, bronze trim, swing disc, renewable disc and seat, bolted bonnet, flanged ends.

C. Acceptable Manufacturers – Swing Check Valves

Manufacturer	Threaded ½-2 Inches	Flanged Over 2 Inches
Crane	_--------_____	373
Milwaukee	509	_-------____
Nibco	T-413-Y	F-918-B
Stockham	B-318	G-931

2.16 SPRING LOADED CHECK VALVES

A. Up to 2 inches: Bronze body, ASTM B62, Class 125, stainless steel spring loaded, threaded.

B. Over 2 inches: Iron body, Class 125 bronze trim, spring loaded, renewable composition disc, water ends.

C. Acceptable Manufacturers – Spring Loaded Check Valves

Manufacturer	Threaded ½-2 Inches	Wafer Over 2 Inches
Nibco	T-480(-Y)	W-910-W
Stockham	-------	WG-970

2.17 RELIEF VALVES

A. Bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

B. Acceptable Manufacturers: Kunkle, IT&T Fluid Handling Division, Sarco, Watts.

2.18 CURB BOXES

A. Cast iron, 9 inch diameter shaft, standard hexagonal head, brass lid locking bolt, adjustable length, lid with the word "WATER" cast thereon.

B. Acceptable Manufacturers – Curb Boxes

Manufacturer	**Model**
Biddy – Ste. Croix Foundries	B-7001
Meuller	H-10306 Series

2.19 FLOW CONTROL VALVES

A. Bronze body and trim, globe or ball style, balance valve with hand wheel with vanier type ring setting and memory stop, drain connection, readout valves equipped with integral check valves and gasketed caps.

b. Portable meter consisting of case containing one, 0.50 percent accuracy pressure gages with 0-100 feet pressure range for 500 psig maximum working pressure, color coded hoses for low and high pressure connections, and connectors suitable for connection to read-out valves.

C. Acceptable Manufacturers: Armstrong Pump, IT&T Fluid Handling Division, Teco.

PART 3 EXECUTION

3.01 IDENITFICATION AND PROTECTION OF UNDERGROUND PIPING

A. Clearly indicate during the construction period the location of any underground piping installed and protect such underground piping from damage during the construction period.

3.02 GENERAL PIPING INSTALLATION

A. Furnish and install a complete system of piping, all valved as indicated or as necessary to control the system and all appurtenances, as shown on the drawings, as necessary to complete the working systems and accordance with the intent of drawings and specifications. The piping drawings are diagrammatic and indicate the general location, arrangement and connections. The piping may have to be offset, lowered, or raised as directed at the site. This does not relieve the Contractor from the responsibility for the proper erection of systems of piping in every respect suitable for the work intended and as described in the specifications and approved by the Architect. Location and arrangement of piping layout take into consideration and sizing and friction loss, expansion, contraction, and other design considerations. So far as practical, install piping as indicated, to conserve building space and not interfere with use of space.

B. Piping shall be properly supported and adequate provisions shall be made for sxpansion, contraction, slope and anchorage. All piping shall be cut accurately for fabrication to measurements established at the construction site. Pipe shall be worked into place without spring and forcing, properly clearing all windows,

doors, openings and equipment. Cutting or weakening of the building structure to facilitate installation will not be permitted. All pipes shall have burr and cutting slag removed by reaming or other cleaning methods. All changes in direction shall be made with fittings.

C. All piping shall be arranged so as not to interfere with removal of other equipment or devices, nor to block access to doors, windows, manholes, or other access openings. Piping shall be arranged so as to facilitate removal of tube bundles. Flanges of unions, as applicable for the type of piping specified, shall be provided in the piping at connections to all items of equipment. Piping shall be placed and installed so that there will be no interference with the installation of equipment, ducts, etc. All piping shall be installed to insure noiseless circulation. All valves and specialties shall be placed to permit easy operation and access, and all valves shall be regulated and packed and glands adjusted at the completion of the work before final acceptance. All piping shall be installed so as to avoid air or liquid throughout the work.

D. Expansion and contraction of piping shall be provided by expansion loops to prevent injury to connections, piping, equipment, or the building. Expansion and anchorage provisions shall be in accordance with accepted industry practices.

E. Minimum slopes of piping shall be in accordance with the following, unless otherwise specifically shown on the drawings or specified.

Type of Piping or Fluid Conveyed	**System Component**	**Length for 1" Fall**	**Direction of Flow**
Waste, Sanitary and	Mains or Branch-Inside	4 ft.	Dir. of Flow
Domestic Water	Mains or Branches	Pitch to Drain	--------
Natural Gas	Pitch to Condensate Drip Legs		--------
Fire & Sprinkler Piping	Pitch to Drain per NFPA Requirements		---------

F. Install unions on all by-passes, at traps, at connections to equipment, and as shown on drawings, and where required to facilitate removal of equipment.

G. All open ends of pipe and equipment shall be properly capped or plugged to keep dirt and other foreign materials out of the system. Plugs of rags, wood, cotton, waste, or similar materials are unacceptable.

H. If the size of any piping is not clearly evident on the drawings, the Contractor shall request instructions from the Architect as to the proper sizing. Any changes resulting from the Contractor's failures to request clarification shall be at his expense.

I. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted unless expressly indicated.

J. Install piping free of sags or bends with ample space between piping to permit proper insulation applications.

K. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceiling, below grade or floors, unless indicated to be exposed.

L. Install piping tight to slabs, beams, joints, columns, walls and other permanent elements of the building. Provide space to permit insulation applications, with 1-inch clearance outside the insulation. Allow sufficient space above the removable ceiling panels to allow for panel removal. Provide access doors to concealed valves.

M. Locate groups of pipes parallel to each other, at common elevations, space to permit applying full insulation and servicing of values.

N. Install drains at low points in mains, risers, and branch lines consisting of a tee fitting, ¾ inch ball valve, and short ¾ inch threaded nipple and cap.

O. Provide nonconducting dielectric connections whenever joining dissimilar metals.

P. Establish elevations of buried piping outside the building to ensure not less than four (4) feet of cover.

Q. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

R. Prepare piping, fitting, supports and accessories not pre-finished, ready for finish painting.

S. Coordinate the installation of piping sleeves for foundation wall penetrations.

T. Install valves with stems upright or horizontal, not inverted.

3.03 DRAINAGE AND VENT PIPING INSTALLATION

A. Install cast-iron soil pipe and cast-iron soil pipe fittings according to CISPI 1990 revised and edited edition of “Cast Iron Soil Pipe and Fittings Handbook, Volume 1,” Chapter IV, “Installation of Cast Iron Soil Pipe and Fittings.”

B. Make all required connections to sewers, building drains, and related work. Exercise extreme care to prevent debris from entering sewers and drains. Check carefully the invert elevations of sewers and drains to which new connections are to be made.

C. Make changes in direction for drainage and vent piping using appropriate Y fittings, Y fittings with 1/8 bends, and long sweep 1/4. 1/5. 1/6. 1/8, and 1/16 bends. Sanitary tees and short-sweep quarter bends may be used on vertical stacks of drainage piping where change in directions of flow is from horizontal to vertical. Use long-turn double-Y fitting and 1/8-bend fittings where 2 fixtures are installed back to back or side by side and have a common drain. Straight tees,

elbows, and crosses may be used on vent lines. Make no change in direction of flow greater than 90 degrees. Where different sizes of drainage pipes and fittings are connected, use proper size standard increases and reducers. Reduction of the size of drainage piping in the direction of flow is prohibited.

D. Lay buried building drains beginning at low point of each system, true to grades and alignment indicated, with unbroken continuity of invert. Place hub or bell ends of piping facing upstream. Install required gaskets according to manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Maintain swab or drag in piping and pull past each joint as completed.

E. Test pipe for soundness, clean interior and joint surfaces before lowing the pipe into trench. Lay pipe in straight lines and of uniform grades between points where changes in alignment of grade are shown or required. Bed the barrel firmly and uniformly as hereinafter specified, Check the line and invert grade of each pipe from a top line carrier on better boards not over 25 feet apart.

F. Fit the pipe to form close joints. Perform pumping or bailing as necessary to avoid laying the pipe in water and to protect joints. Keep a stopper in the pipe mouth when layout is not in progress.

G. Flush all sewer piping with water in sufficient volume to obtain free flow through each pipe. Remove all obstructions and correct all defects discovered.

H. Install drainage and vent piping at the following minimum slopes, except where another slope is indicated.

1. Sanitary Building Drain: ¼ inch per foot (2 percent) for piping 3 inches and smaller, 1/8 inch per foot (1 percent) for piping 4 inches and larger.

2. Horizontal Sanitary Drainage Piping: ¼ inch per foot (2 percent)

3. Vent Piping: 1/8 inch per foot (1 percent)

I. Sleeves are not required for cast-iron soil pipes passing through concrete slab, without membrane waterproofing, on grade.

J. Install PVC drainage pipe and fittings according to ASTM D 2665,

K. Sewer, Drain, and Vent Joint Construction.

1. Cast-Iron Soil Pipe and Cast-Iron Soil Pipe Fitting Joints: Make joints according to recommendations in CISPI 1990 revised and edited edition of "Cast Iron Soil Pipe and Fittings Handbook, Volume 1," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

2. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling during joining of plastic pipe and fittings with solvent cements.

3. Joints between pipes of dissimilar materials, such as clay and cast iron, shall be made with pre-fabricated flexible couplings and joint sealers, as manufactured by the Fernco Joint Sealer Company.

L. Venting

1. Main sanitary soil, waste and vent stacks shall be extended a minimum of 18” above roof and, where less than 3” in size, shall be increased in diameter to 3” at not less than 12” below roof.

2. Branch vent headers shall be run 6” or more above top of fixtures and pitch downward continuously toward the fixture traps so as to drain condensation. Vent stacks shall be connected into adjacent soil or waste stacks above the highest branch vent connection or shall be extended through the roof.

M. Final Drainage and Vent Inspection

1. At the time of final inspection of the work performed, the sewer and vent systems shall be complete in every respect and in perfect operating condition. All surplus materials of every description resulting from the work and shall have been removed. Piping shall be free of sand, silt, or other obstructions. Any defects discovered in the piping systems subsequent to this inspection shall have been corrected.

3.04 FIELD QUALITY CONTROL

A. General

1. Make all preliminary and final tests at the site on the sanitary (acid) drainage systems, storm drainage systems, natural gas piping, vent piping and on the domestic water systems piping. Provide all testing instruments, pumps, smoke machines, gauges and other equipment for all tests and the services of competent mechanics for conducting same. Pay all fees required by public authorities in connection with such tests.

2. No piping shall be concealed or covered until it has been tested. When the progress of the construction demands, and with the permission of the Professional, the piping may be inspected and tested in sections. All testing equipment shall be provided by this Contractor.

3. All tests shall be made in the presence of a representative of the Architect. This Contractor shall notify the Architect and all authorities at least forty-eight (48) hours in advance of such tests. Preliminary tests shall be made before giving such notification.

4. All systems shall be left in good operating condition. If defects of material or workmanship in piping systems or equipment are disclosed as a result of these tests and operations, repairs shall be made by this Contractor, using new materials and all defective materials shall be removed from the site immediately. Tests shall be repeated until a satisfactory test has been made.

5. No caulking of screwed joints, cracks, or holes, will be acceptable. Replacing shall be the full length of defective sections of pipe. Defective apparatus shall be removed from the site and replaced by apparatus conforming to the requirements of the specifications. The entire cost of repairs and replacements shall be borne by this Contractor.

B. Test Water Distribution Piping As Follows:

1. Test for leaks and defects in new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of system tested.

2. Leave uncovered and unconcealed in new, altered, extended, or replaced water distribution piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved for testing.

3. Cap and subject the piping system to a static water pressure of 50 psig above the operating pressure without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.

4. Repair leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained.

5. Prepare reports for tests and required corrective action.

C. Drainage and Vent Piping System Tests: Test drainage and vent systems according to procedures of authority having jurisdiction or, in absence of published procedure, as follows:

1. Test for leaks and defects in new drainage and vent piping and vent piping systems and parts of existing systems that have been altered, estended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.

2. Leave uncovered and unconcealed in new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose for testing work that has been covered or concealed before it has been tested and approved.

3. Rough Plumbing Test Procedure: Except for downspouts and perforated foundation/footing drain, test piping of plumbing drainage and venting systems on completion of roughing-in piping installation. Tightly close all openings in piping system and fill with water to point of overflow, but not less than 10 feet head of water. Water level shall not drop during the period from 15 minutes before inspection starts through completion of inspection. Inspect for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and their traps filled with water, test connections and prove gas and watertight. Plug stack openings on roof and building drain where it leaves the building and introduce air into the system equal to pressure of 1-inch water column. Use a U tube or manometer inserted in the trap of a water closet to measure this pressure. Air pressure shall remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.

6. Prepare reports for tests and required corrective action.

7. The exterior building sanitary and storm sewers shall be tested with a running flow of water or equivalent, and found to be light.

D. Gas Piping:

1. Gas piping shall be tested in accordance with the regulations of the utility and a Certificate of Acceptance shall be obtained from the gas company and delivered to the Architect.

E. Plumbing Fixtures:

1. The operation of all plumbing fixtures after installation and connection shall be tested to the satisfaction of the Owner.

F. Equipment:

1. All equipment shall have an eight hour operating test, during which time the Contractor shall demonstrate, to the satisfaction of the Architect, that the equipment is working properly and that all controls and safety devices are functioning properly.

3.05 CLEANING

A, Clean and disinfect water distribution piping as follows:

1. Purge new potable water distribution piping systems, verify system is complete, flushed and clean prior to use.

2. Use purging and disinfecting procedure prescribed by authority having jurisdiction or, if a method is not prescribed by that authority, the procedure described in either AWWA C651 or AWWA C652 or as described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets. Ensure PH of water is between 7.4 and 7.6 by adding acid or alkali.

b. Fill system or part thereof with water/chlorine solution containing at least 50 parts per million of chlorine. Isolate (valve off) and allow to stand for 24 hours.

c. Drain system or part thereof of previous solution and refill with water/chlorine solution containing at least 200 parts per million of chlorine. Isolate and allow to stand for 3 hours.

d. Flush system with clean, potable water until chlorine does not remain in water coming from system following allowed standing time.

e. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, analyze in accordance with AWWA C601.

f. Submit water samples in sterile bottles to authority having jurisdiction. Repeat procedure if biological examination made by the authority shows evidence of unacceptable contamination.

B. Prepare and submit reports for purging and disinfecting activities.

C. Clean interior of piping system. Remove dirt and debris as work progresses.

D. Comply with local utility company requirements where they differ from these requirements.

3.06 COMMISSIONS

A. Fill water systems. Check water heaters and thermal expansion tanks to determine that they are not bound and that system is completely full of water.

B. Before operating systems, perform these steps:

1. Close drain valves, hydrants, and hose bibs.

2. Open shutoff valves to full open position.

3. Open throttling valves to proper setting.

4. Remove plugs used during testing of piping systems and plugs used for temporary sealing of piping during installation.

5. Remove and clean strainer screens. Close drain valves and replace drain plugs.

6. Remove filter cartridges from housing and verify that cartridges are as specified for application where used, clean and ready for use.

C. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

D. Check plumbing specialties and verify proper settings, adjustments, and operation.

E. Energize pumps and verify proper rotation and operation.

3.07 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of day or when work stops.

C. Exposed PVC Piping: Protect plumbing vent exposed to sunlight with 2 coats of a water-based latex paint.

END OF SECTION

SECTION 15860

CENTRIFUGAL FANS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Backward inclined centrifugal fans.

B. Forward curved centrifugal fans.

C. Airfoil centrifugal fans.

D. Direct drive in-line centrifugal fans.

E. Belt drive in-line centrifugal fans.

F. Power Roof Exhausters.

G. Motors and drivers.

H. Belt Guards.

I. Inlet/outlet screens.

J. Access doors.

K. Scroll drains.

1.2 RELATED WORK

A. Section 15010 – Basic Mechanical Requirements

B. Section 15240 – Mechanical Sound and Vibration Control and Seismic Restraints

C. Section 15250 – Mechanical Insulation

D. Section 15850 – Air Handling Units

E. Section 15890 – Ductwork

F. Section 15910 – Ductwork Accessories

1.3 REFERENCES

A. AMCA 99 – Standards Handbook.

B. AMCA 210 – Laboratory Methods of Testing Fans for Rating Purposes.

C. AMCA 300 – Test Code for Sound Rating Air Moving Devices.

D. AMCA 301 – Method of Calculating Fan Sound Ratings from Laboratory Test Data.

E. ANSI/AFBMA 9 – Load Ratings and Fatigue Life for Ball Bearings.

F. ANSI/AFBMA 11 – Load Ratings and Fatigue Life for Roller Bearings.

G. SMACNA – Low Pressure Duct Construction Standard.

1.4 QUALITY ASSURANCE

A. Performance Ratings: Conform to AMCA 210 and beat the AMCA Certified Rating Seal

B. Sound Ratings: AMCA 301, tested to AMCA 300 and bear AMCA Certified Sound Rating Seal.

C. Fabrication: Conform to AMCA 99.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site and store under provisions of Division 1 and Section 15010.

B. Protect motors, shafts, and bearings from weather and construction dust.

1.6 SUBMITTALS

A. Provide dimensional details, weights, access requirements and electric characteristics.

B. Provide fan curves with specified operating point clearly marked.

C. Submit fan inlet, outlet and radiated round power levels at rated capacity.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 15010.

B. Include instruction for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

PART 2 PRODUCTS

2.1 UTILITY FANS

A. Greenheck

B. Penn Ventilator

C. Loren Cook

D. Barry Blower

2.2 GENERAL

A. Fans shall be capable of accommodating static pressure variations of plus or minus 10 percent.

B. Statically and dynamically balance fans to eliminate vibration or noise transmission to occupied areas.

2.3 WHEEL AND INLET

A. Backward inclined: Steel construction with smooth curved inlet flange, heavy backplate, backwardly curved blades welded or riveted to flange and backplate; cast iron or cast steel hub riveted to backplate and keyed to shaft with set screws.

B. Forward Curved: Galvanized steel construction with inlet flange, backplate, shallow blades with inlet and tip curved forward in direction of air flow, mechanically secured to flange and backplate; steel hub swaged to backplated and keyed to shaft with set screw.

C. Airfoil Wheel: Steel construction with smooth curved inlet flange, heavy backplate die formed hollow airfoil shaped blades continuously welded at tip flange, and backplate; cast iron or cast steel hub riveted to backplate and keyed to shaft with set screws.

2.4 HOUSING

A. Heavy gage steel, spot weld for AMCA 99 designated Class I and II fans, and continuously welded for Class III, adequately braced, designated to minimize turbulence with spun inlet bell and shaped cut-off.

B. Factory finish before assembly with enamel or prime coat.

C. Provide bolted construction with horizontal flanged split housing

D. Weatherproof motor and drive covers at utility sets.

E. Provide inspection access panels at wheels of all blowers.

F. Externally paint fans exposed to weather to provide corrosion resistance to environment.

2.5 DIRECT DRIVE SQUARE IN-LINE CENTRIFUGAL FANS

A. Fan housing shall be of the square design, constructed of heavy gauge galvanized steel and shall include square duct mounting collars.

B. Fan construction shall include two removable access panels located perpendicular to the motor mounting panel. The access panels must be of sufficient size to permit easy access to all interior components.

C. The fan wheel shall be centrifugal backward inclined, constructed of aluminum and shall include a wheel cone carefully matched to the inlet cone for precise running tolerances. Wheels shall be statically and dynamically balanced.

D. Motors shall be permanently lubricated and matched to the fan loads. Motors shall be readily accessible for maintenance.

E. A NEMA 1 disconnect switch shall be provided for each fan. Factory wiring shall be provided from motor to the handy box.

F. Fans shall be supplied with a speed controller for installation adjacent to the fan.

2.6 MOTORS AND DRIVES

A. Motors: As previously specified in the Division.

B. Bearings: ANSI/AFBMA 9, L-10 life at 200,000 hours, heavy duty pillow block type, self-aligning, grease-lubricated ball bearings, or ANSI/AFBMA 1, L-50 life at 400,000 hours, pillow block type, self-aligning, grease-lubricated roller bearings

C. Shafts: Hot rolled steel, ground and polished, with key-way, protectively coated with lubricating oil.

D. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves for motors 15 hp and under, selected so required rpm is obtained with sheaves set at mid-position. Fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.

E. Belt Guard: Fabricate to SMACNA Low Pressure Duct Construction Standards; of 12 gauge, 3/4-inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

F. Mount driving motors on rails for ease in belt tension adjustment.

2.7 ACCESSORIES

A. Fixed Inlet Vanes: Steel construction with fixed cantilevered inlet guide vanes welded to inlet bell.

B. Inlet/Outlet Screens: 1/2-inch mesh galvanized steel welded grid.

C. Access Doors: Shaped to conform to scroll with quick openings latches and gaskets.

D. Scroll Drain: 3/4-inch steel pipe coupling welded to low point of fan scroll.

E. Weatherproof motor and drive coves.

F. Extended bearing lubrication fittings to assure easy access to lubrication points.

2.8 POWER PROOF VENTILATORS

A. Manufacturer

1. Greenheck
2. Penn Ventilator
3. Loren Cook
4. Barry Blower

B. General

1. Electric motor, V-belt driven centrifugal fan type, enclosed in a storm-proof aluminum housing, properly braced and stiffened to form a rigid unit, which will withstand a horizontal pressure of 30 pounds per square foot of projected area.

C. Housing

1. Fabricate from spun aluminum, with heavy-duty corrosion-resistant metal hinges and friction catches, to permit convenient access to motor and fan assembly. Provide structural reinforcing members to support fan wheel, motor and bearings, and vibration elimination devices to prevent transmission of vibration to housing.

D. Fan Assembly

1. Fan Wheel: Non-overloading centrifugal type, fabricated of aluminum or steel, statically and dynamically balanced at factory. Provide grease-packed wheel bearings of the self-aligning, ball bearing, pillow-block type.

2. Drive Assembly: Electric motor-driven V-belt drive, with cast iron or steel pulleys. Provide motor pulley of the variable pitch type, to permit adjustment of fan speed 10 percent above or below speed shown.

3. Motor: Speed or speeds as indicated, suitable for operation with the shaft vertical.

4. Assembly complete with an Underwriters Laboratory Inc. approved nonfused safety-type disconnect switch, located under the fan housing. Factory installed wiring shall be in flexible metal conduit.

E. Accessories

1. Provide 1/2-inch aluminum mechanical bird screens, factory curb.

2.9 POWER ROOF VENTILATORS (DIRECT DRIVEN)

A. Manufacturer

1. Kanalflakt Inc

2. Or equal

B. Housing shall be constructed of galvanized sheet metal. Curb cap, with integral inlet cone, shall be constructed in one piece for weather tightness. Fan shall be supplied with mounted electrical terminal box with pre-wired terminal strip connections. Integral disconnect switch shall be provided on all single phase models. Three phase disconnect shall be provided as specified. Fan housing shall incorporate a well designed inlet venturi for maximum performance.

C. Motorized impeller shall be an external rotor type, class B insulation, totally enclosed with permanent split capacitor (except three phase). Motorized impeller shall be both statically and dynamically balanced as one integral unit of provide for vibration free performance.

D. Motor shall be a permanently sealed self lubricating ball bearing type. Motor shall be equipped with an automatic reset, thermal overload protection. Motor shall be acceptable for continuous duty. Sufficient service factor shall be provided to ensure long maintenance free operation over maximum load conditions.

E. Fan wheel shall be of the backward curved centrifugal type.

F. Accessories: Provide Kanalflakt LCS-1 fan speed control system to modulate the speed of the fan based on the number of driers in operation. Provide 1/2-inch aluminum mechanical bird screens and factory curb.

PART 3 EXECUTION

3.1 INSTALLATION

A. Do not operate fans for any purpose, temporary or permanent, until construction filters are in place, bearings lubricated, and fan has been test run under opservation.

B. Install fans as indicated, with resilient mountings and flexible electric leads. Refer to Section 15240.

C. Install flexible connections specified in Section 15910 between fan inlet and discharge ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.

D. Install fan restraining snubbers. Refer to Section 15240. Flexible connectors shall not be in tension while running.

E. Provide sheaves required for final air balance.

F. Provide safety screen where inlet or outlet is exposed.

G. Pipe scroll drains to nearest floor drain.

H. Provide backdraft dampers on discharge of exhaust fans.

I. Provide miscellaneous steel for mounting if all return, exhaust and supply fans in orientation shown on the drawings.

END OF SECTION 15860

SECTION 16141

Receptacles and Boxes

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Poke-Through Service Fittings

1.2 REFERENCES

A. NECA- Standard of Installation

B. NFPA 70 – National Electrical Code

1.3 SUBMITTALS FOR REVIEW

A. Section 16010-Submittals: Procedures for submittals

B. Product Data: Provide manufacture's catalog information showing dimensions, colors, and configurations.

C. Protect cement from moisture and humidity

1.4 SUBMITTALS FOR INFORMATION

A. Section 16010- Submittals: Submittals for Information

B. Submit manufacturer's installation instructions

1.5 QUALIFICATION

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70

B. Provide Products listed and classified by Underwriters Laboratories, Inc., or a testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 POKE-THROUGH FITTINGS

A. Flush Convenience Receptacle Poke-thru:

1. Hubbell Incorp. Model PT7FGY.

2. Raceway Components Inc. Model RC-700-A

3. Walker Co. Model 1570-A.

4. Substitutions: Refer to Section 16010.

5. Material: Diecast Aluminum and Plastic

6. Configuration: Duplex flap opening.

(Refer to 16701 and 16702 for proper device.)

B. Flush Communication outlet poke-thru:

1. Raceway Components Inc. Model RC-900-A-M-D.

2. Substitutions: Refer to Section 16010.

3. Device Plate: Die-Cast aluminum and plastic.

4. Configuration: Duplex flap opening.

(Refer to 16701 and 16702 for proper device.)

C. GFCI Receptacle: 125V, 20 A

1. Hubbell Incorp. Model GF536I.

2. Leviton Mfg. Co. Model 6898-I.

3. Arrow Hart Model GF5362

4. Pass and Seymour 2091-I

D. Weatherproof GFI Receptacle Cover Plate: Rating maintained while in use.

1. Taymac Corp. Model 20350

2. Red Dot

3. Slater

4. Substitutions: Refer to Section 16010.

5. Provide horizontal if receptacle is mounted horizontally.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 16010- Coordination and Meetings: Verification of existing conditions prior to beginning work.

B. Verify that outlet boxes are installed at proper height.

C. Verify that wall opening are neatly cut and will be completely covered by wall plates.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install in accordance with NECA "Standard of Installation" except for mounting heights. Refer to Section 16010 for mounting heights.

B. Install devices plumb and level.

C. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

D. Install [protective rings] [split nozzle] on active flush cover service fittings.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of floor boxes provided with approved furniture layouts.

3.5 FIELD QUALITY CONTROL

A. Section 16010: Field adjusting and balancing.

3.6 ADJUSTING

A. Section 16010: Adjusting installed work.

B. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Section 16010; Cleaning installed work.

B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION 16141

SECTION 16500

LIGHTING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The General Documents, as listed on the Table of Contents and applicable parts of Division 1, General Requirements, and requirements of Section 16010, shall be included in and made part of this section.

B. Examine all drawings and all other Section of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other Trades affecting or affected by work of this Section. Cooperate with such Trades to ensure the steady progress of all work under the Contract.

1.02 RELATED SECTIONS

A. The following referenced sections are listed as a minimum of additional requirements and/or work not included in this Section which may be required to be performed under other designated Sections:

1. Section 16100: Electrical

1.03 REFERENCES

A. All lighting fixtures including custom fixtures and modified standard products shall comply with all applicable provisions of the following Codes and Trade Standard Publications, and are herby incorporated into, and made a part of, the Contract Documents:

1. NFPA 70: National Electrical Code

2. UL: Underwriters' Laboratories

3. NEC: National Electrical Code

4. CBM: Certified Ballast Manufacturers Associations

5. IES: Illuminating Engineering Society

6. ASTM: American Society for Testing and Materials

7. ANSI: American National Standards Institute

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery of materials shall be made to the project by the materials supplier in accordance with the instructions of the Contractor.

B. The Contractor shall provide adequate storage space for the materials, shall be responsible for all items of materials after receipt from the supplier, and shall replace all materials lost or damaged after delivery and receipt.

C. The Contractor shall furnish the materials supplier with receipts for all materials and accessory items received, and shall send copies of these receipts to the architect.

PART 2 PRODUCTS

2.01 MATERIALS

A. General Description

1. Provide fixtures, completely factory assembled, wired, and equipped with necessary sockets, ballasts, wiring, shielding, reflectors, channels, lenses, and other parts and appurtenances necessary to complete the fixture installation and deliver to project site ready for installation.

2.02 FINISHES

A. Lighting fixture finishes shall be selected by the Architect. The Architect shall select finishes and indicate the color selections on the shop drawing submittals.

2.03 FIXTURE WIRING

A. Provide wiring channels and wireways free from projections and rough or sharp edges throughout. At points or edges over which conductors shall pass and may be subject to injury or wear, round bush to make a smooth contact surface with the conductors.

B. Install insulated bushings at points of entrance and exit of flexible wiring.

PART 3 EXECUTION

3.01 INSTALLATION

A. Lighting Fixtures

1. Furnish, assemble, hang and connect all lighting fixtures. Lighting fixtures shall be as indicated on the drawings.

2. Install each fixture properly and safely. Provide hangers, rods, mounting brackets, supports, frames, yokes, support bars and any other equipment required for a complete installation.

3. Lay-in recessed fixtures in grid type ceilings shall be supported from the underside of roof or floor slab, and utilize adequate hangers with attachments to building construction independent of other systems. All fluorescent fixtures shall have a minimum of (2) hangers supports and all incandescent fixtures shall have at least one hanger support.

4. All lighting fixtures shall be supported from the slab above and shall not be suspended from ducts, piping, equipment, ceiling support system, etc.

5. Where continuous rows of lighting fixtures are installed (pendant mounted), the Electrical Contractor shall furnish and install appropriate mounting channels to properly align fixtures. Use Kindorf or Unistrut channels.

6. Before ordering fixtures, the Electrical Contractor shall verify with the General Contractor the type of ceiling which shall be used in various spaces.

7. Coordinate fixture locations and mounting heights with Architectural plans, reflected ceiling plans and other reference data prior to installation.

8. Do not scale electrical drawings for exact location of the lighting fixtures. Consult the architectural reflected ceiling plans for the proper locations of lighting fixtures.

9. Prior to fabrication and submittal of shop drawings, check for adequate headroom and non-interference with other equipment such as ducts, pipes, or openings.

10. Pendant or surface mounted fixtures shall be provided with required mounting devices and accessories, including hickeys, stud extensions, ball aligners, canopies and stems. Locations of fixtures in mechanical areas shall be coordinated with the Mechanical Contractor. Mounting stems of pendant fixtures shall be of the correct length to uniformly maintain the fixture heights shown on the drawings. Variation in mounting individual fixtures shall not exceed ¼ inch. Height shall not vary more than ½ inch from the floor mounting height shown on the drawings. Fixtures hung in continuous runs shall be installed absolutely level and in line with each other. Hanging devices shall comply with Code requirements. Use single stem hangers (double stem hangers shall not be acceptable). Threaded rods shall be used to support lighting fixtures in those spaces where no other means of support is attainable, and only if fixtures are installed absolutely level with no looseness for movement, and only if approved by Code.

11. Rigidly align continuous rows of lighting fixtures for true in-line appearance, subject to Architect's approval.

12. Install pendant lighting fixtures plumb and at a height from the floor as specified or indicated on the drawings. In cases where conditions make this impractical, refer to the Architect and install as directed. Use ball aligners and canopies on pendant fixtures unless noted otherwise.

13. Do not install fixtures and/or parts such as finishing plates and trims for recessed fixtures until all plastering and painting that may mar fitting finish has been completed.

14. Housing shall be rigidly installed and adjusted to a neat flush fit with the ceiling or other finished mounting surface.

15. The housings of recessed lighting fixtures shall be adequately protected during installation.

16. Install reflector cones, baffles, aperture plates, light controlling element for air handling fixtures, and decorative elements after completion of ceiling tiles, painting and general cleanup.

17. Replace blemished, damaged, or unsatisfactory fixtures as directed.

18 Exterior poles, bases and any other fixture or fixture components with scratched or damaged finish shall be repainted to match specified color. Pole mounted fixtures shall be provided with inline fuses located in base.

19. Any lamps, ballasts, reflectors, lens, diffusers, side panels or other parts damaged prior to the final inspection shall be replaced at no expense to the U Penn Physical Plant Project Engineer.

20. At time of final inspection, all fixtures and equipment shall be fully lamped, and shall be complete with required lenses or diffusers, reflectors, side panels, louvers or other components necessary.

21. All recessed incandescent lighting fixtures shall be provided with thermal cutoff devices which shall conform to the requirements rated for control of incandescent lamps, as indicated by the NEC Article 410-65(c) and as specified by UL.

22. Each lighting fixture shall be packaged with complete instructions and illustrations showing how to install. Install lighting fixtures in strict conformance with manufacturer's recommendation and instructions.

23. Provide fixtures constructed, wired, and installed in compliance with the current edition of applicable City, State and National Codes. Provide fixtures conforming to UL Standards, and to provisions of applicable Codes which exceed those Standards. In addition, provide fixtures which conform to additional Regulations necessary to obtain approval for use of specified fixtures in locations shown. Use only electrical components UL listed.

24. Particular attention is called to Article 410 of the NEC. Provide only fixtures that meet these requirements, as interpreted by local agencies. As manufacturers' catalogue number may not include thermal protection devices, it is Contractor's responsibility to coordinate the fixture provided with the ceiling construction in accordance with Local Code enforcement practice.

END OF SECTION