ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

DESCRIPTION

The work shall consist of furnishing all labor, materials, tools and equipment and perform all operations necessary for the construction of the enclosure under the FDR Drive between East 61st St. and East 62nd St., complete, in accordance with the Contract Drawings, these specifications and as ordered by the Engineer.

The work shall include:

Furnish and install complete, all construction items required as specified in Division 4, 5, 6, 7, 8 and 9 of the specifications, including but not limited to the following:

- Glazed concrete masonry units, with mortar, anchorage devices and related accessories.
- Exterior glazed wall tile with setting materials and grout,
- Steel roll-up doors, frames and related hardware, miscellaneous steel and
- Painting as required.

Obtain all permits and pay all fees required for construction.

The work under this item does not include:

- General Site Construction work
- Construction of the FDR Drive Structure
- Construction of reinforced concrete wall surrounding the enclosure

Limits of the work are shown in the Contract Drawings. Wherever reference is made in Division 4, 5, 6, 7, 8 and 9 of this specification to an item in the “Standard Specification” the method of measurement and basis of payment requirements shall be omitted and the cost thereof included in the price bid for this item.

MATERIALS AND CONSTRUCTION DETAILS

The Contractor shall refer to the attached “Products and Execution” portions of these specifications.

METHOD OF MEASUREMENT

This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

BASIS OF PAYMENT

The lump sum price bid shall include the cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the plans, and as specified under this item.

SECTIONS

Monthly payments will be made for this item in proportion to the total amount of work completed.

Before the first payment estimate is issued for work under this item, the Contractor shall furnish to the Engineer, a detailed estimate of quantities and prices of all materials and labor included under this item, which shall aggregate the contract lump sum price bid for this item. This estimate shall be made out in such form as required and, if requested, supported by such evidence of its correctness as the Engineer may direct. This evidence shall include certified copies of subcontracts.

The Contractor agrees that this detailed estimate shall not become effective until it has been approved by the Engineer, who will have the right to revise the estimate as, in his judgment, may be required to make the various subdivisions of work conform to their true value. The approved detail estimate will be used as a basis for monthly or semi-monthly payments for work completed under this item. The proportionate share for bond premiums for this item shall not be listed as a separate item but its cost shall be distributed pro rate throughout the estimate for this item.
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE
SECTION 04065 - MASONRY MORTAR

PART 1  GENERAL

1.01 Description of Work
A. The Contractor shall furnish all labor, materials, tools and equipment for masonry mortar and glazed concrete masonry unit installation as specified herein and indicated on the Contract Drawings as directed by the Engineer.
B. The Contractor shall not change source or brands of masonry mortar materials during the course of work.
C. Cementitious materials shall be delivered in unopened containers marked and labeled with the manufacturers' names and brands.
D. Cementitious materials and aggregates shall be protected from rain, moisture and air-borne contaminants.

1.02 Submittal Requirements
A. Submit manufacturer's specifications and instructions for each manufactured product. Indicate that copy of each applicable instruction has been distributed to the masonry installer.
B. Submit samples of each type of colored masonry mortar, showing the range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used.

1.03 Efflorescence Tests
A. A specimen of each proposed mix, weighing approximately 0.1 liters, shall be prepared using as little water as possible. While still in the plastic condition and prior to its initial set, each specimen shall be placed in a glass or glazed receptacle, and 0.13 liters distilled water shall be mixed with the specimen and stirred thoroughly for 5 minutes. The receptacle shall be of such a size that when the specimen and water are combined in solution and a masonry unit is placed into it, the solution shall have a depth of 12 to 25 mm. A masonry unit, which has been tested and found free of efflorescence, shall be placed on end in the solution and the water level maintained at 12 to 25 mm with distilled water. After being indoors at temperatures of 24 deg C. (75 degrees F) plus or minus 8 deg C. (15 degrees F) for 7 days, the masonry unit shall be removed from the solution and air dried for 24 hours. The masonry unit shall be compared with an untreated unit, and if the difference due to efflorescence is noticeable, when viewed at a distance of 3 m, the components of the mixes shall be tested in separate receptacles, each containing a masonry unit which has been tested and found free of efflorescence. The cementitious components shall be prepared for testing by thoroughly mixing .03 liters of the cementitious material with 0.13 liters of distilled water; and the aggregate component shall be prepared for testing by thoroughly mixing 0.1 liters of the aggregate component.
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

with 0.13 liters of distilled water. Each mixture shall be tested as specified above for the proposed mix. The component causing efflorescence will be rejected.

2.0 MATERIALS

2.01 Masonry Mortar Materials

A. Portland Cement: ASTM C 150, Type I, non-staining.

B. Hydrated Lime: ASTM C207, Type Sa.

C. Aggregates for Mortar: shall be ASTM C 144 except that the grading shall comply with the following limits:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
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<tr>
<td>No. 4 (4.76-mm)</td>
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<tr>
<td>No. 8 (2.38-mm)</td>
<td>95 to 100</td>
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<tr>
<td>No. 16 (1.19-mm)</td>
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<td>No. 30 (595-um)</td>
<td>35 to 70</td>
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<tr>
<td>No. 50 (297-um)</td>
<td>15 to 35</td>
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<td>No. 100 (149-um)</td>
<td>2 to 15</td>
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<tr>
<td>No. 200 (74-um)</td>
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Sand shall consist of clean, hard, strong, uncoated grains, free from salt or flaky particles, loam, alkali, organic matter or other deleterious material.

D. Water shall be clean, potable, free of oils, alkalis, salts, organic materials or other materials which would be deleterious to mortar or metal in the wall or which would impair strength or bond.

E. Admixtures:

1. No antifreeze compounds or other substances shall be used in the mortar to lower the freezing point.
2. No Calcium chloride or admixtures containing calcium chloride shall be used in the mortar.
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2.02 Mortar Mixes

A. Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents. Do not use masonry cement. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: non-staining, cement-lime mortar complying with ASTM C 270, TABLE 1, Proportion Specification Requirements, Proportions by Volume, but limiting acceptable types to those listed below for cement-lime mixes.
   1. Type M: 1/4 part lime per part of Portland cement.
   2. Type S: Over 1/4 up to ½ part lime per part of Portland cement.

C. Use Type M mortar for masonry below grade and in contact with earth. Use Type S mortar for exterior above grade load-bearing and non-loadbearing walls, parapet walls, pavements, and for interior load-bearing walls and non-load-bearing partitions.

3.0 CONSTRUCTION METHODS

3.1 Mixing Of Mortar

A. Mortar shall be mixed in a clean mechanically operated mortar mixer for at least 3 minutes but not more than 5 minutes after the last mixing water is added.

B. The mixer shall be charged to its full design capacity for each batch and shall be completely emptied before charging the next batch.

C. Measurement of ingredients for mortar shall be either by volume or weight. If ingredients are measured by volume, measurement of sand shall be accomplished by the use of a container of known capacity.

D. Water shall be mixed with the dry ingredients in sufficient amount to provide a workable mixture which shall adhere to the vertical surfaces of masonry units.

E. Mortar that has stiffened because of loss of water through evaporation shall be retempered by adding water to restore the proper consistency and workability.

F. Mortar that has reached its initial set or that has not been used or placed in final position within 2 hours shall be discarded.
### ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

#### Submittal Approvals

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<thead>
<tr>
<th>Paragraph No.</th>
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<th>Approval By (Engineer or Designer)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1.3a Manufacturers specifications and instructions and indication that copy was distributed to masonry contractor</td>
<td>Engineer</td>
</tr>
<tr>
<td>2</td>
<td>1.3b Samples</td>
<td>Designer</td>
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</table>

**Note:**

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### END OF SECTION
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE
SECTION 04082 - MASONRY ACCESSORIES

PART I GENERAL

1.01 Scope Of Work

The Contractor shall furnish and install various types of masonry accessories required or indicated on the Contract Drawings as directed by Engineer. The accessories are as follows:

1. Continuous horizontal wire reinforcing and seismicclips.
2. Flexible ties anchored to concrete.
4. Concealed flashings built into masonry work and termination bars.
5. Control joint strips.
6. Weep hole inserts and vents.
7. Mortar net.

1.02 Related Work

A. Mortar shall be as specified in Section 04065
B. General requirements for Glazed Concrete Masonry Units shall be as specified in Section 04200.
C. Joint Sealers shall be as specified in Section 07900.

1.03 Manufacturers

To be Hohmann & Barnard, Inc. or equal and shall be subject to compliance with requirements, manufacturers offering products, including installation instructions which may be incorporated in the work included, but are not limited to those listed.

1.04 Submittal Requirements

Product specifications and installation instructions for each masonry accessory, including data substantiating that materials comply with specified requirements.

2.0 MATERIALS

2.01 Continuous Wire Reinforcing

Provide continuous 5 mm (3/16") diameter, ASTM 580-Type 304 stainless steel wire. Wire to be set back from face of glazed concrete masonry wall a minimum of 19 mm (3/4"). Wire is then to be inserted into seismicclip anchoring system. Provide seismicclips for a single wythe glazed concrete masonry unit. Note: Centerline of seismicclip anchors to be spaced at 406 mm (16") maximum.

2.2 Anchoring Devices For Masonry
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

A. Provide anchors, bars, bolts and flexible ties fabricated from not less than 12 gage steel or 10mm diameter steel rod stock, unless otherwise shown.
B. Unless otherwise indicated masonry shall be anchored to inner concrete wall with stainless steel flexible ties. Ties shall be spaced at 406 mm O.C. vertically and horizontally. Provide anchors which shall permit horizontal and vertical movement of masonry but shall provide lateral restraint.

2.3 Attachments To Concrete

A. Flexible Ties: Furnish flexible ties with ends attached to seismicclips. Seismicclips will then be anchored into concrete masonry unit wall. Fabricate from Type 304 stainless steel. Provide stainless steel of the size and type to suit construction requirements.
B. Advise concrete installer of specific requirements regarding placement of inserts which are to be used by the masonry installer for anchoring of masonry work.

2.4 Flashings For Masonry

A. Concealed flashing, shown to be built into masonry, shall be of the following materials: (Reference shall be made to Section 07620 for a description of locations requiring through wall flashings).

2.5 Miscellaneous Masonry Accessories.

A. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60.
B. Bond Breaker Strips: 15-lb. asphalt roofing felt.
C. Premolded Control Joint Strips: Solid rubber strips with a Shore Type A durometer hardness of 70 to 85, designed to fit standard sash block and maintain lateral stability in masonry wall, size and configuration as indicated or required.
D. Weep hole inserts shall be Model 343W as manufactured by Hohmann and Barnard or approved equal.
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

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<td>1</td>
<td>1.4a Manufacturer’s specifications, installation instructions, and data proving compliance with contract specifications</td>
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Note:
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END OF SECTION
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE
SECTION 04200 - GLAZED CONCRETE MASONRY UNITS

PART 1 GENERAL

1.01 Scope of Work

The Contractor shall furnish all labor, materials, tools and equipment necessary for installation of Glazed Concrete Masonry Unit as indicated on the drawings.

1.02 Related Work

A. Masonry Mortar as specified in Section 04065.

A. Masonry accessories as specified in Section 04082.

1.03 Submittal

A. Submit color samples for selection from manufacturer’s series. Colors defined on plans. Submit product literature, certifications, test reports, full size sample(s) of each color specified or selected.

1.04 Quality Assurance

A. All glazed concrete masonry units shall be ASTRA-GLAZE-SW units manufactured by TRENWYTH INDUSTRIES, INC., or equal concrete blocks for glazing shall be lightweight units conforming to ASTM C90 Type 1. The glazed surface shall have a smooth satin-gloss finish, externally heat-polymerized cast-on facing conforming to ASTM C744 and all applicable Federal Specifications.

B. Fire Resistance: 2 Hour Fire Rating.

C. Field Constructed Mock-ups: Construct a sample panel, no less than 1.2m x 1.2m, of units of each color and size to be used in the project.

1.05 Delivery, Storage and Handling

A. Glazed concrete masonry units shall be delivered to the jobsite on banded pallets with individual protective covers on each glazed block face. Keep protective block covers on the blocks until installation. Store pallets in single-stacks on level ground and cover with waterproof covering (e.g., tarpaulins) to protect the blocks from inclement weather. Handle blocks carefully to avoid breakage and damage to the finished surface.
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1.06 Project/Site Conditions

A. Protection of Work: Cover walls each day after installation to keep open walls protected and dry.

PART 2 - PRODUCTS

2.01 Product Name

ASTRA-GLAZE-SW glazed masonry units.

2.02 Manufacturer

1. Trenwyth Industries, Inc., (800) 233-1924
   One Connelly Road, P.O. Box 438
   Emigsville, PA 17318

2.03 Size and Shapes

Actual facing dimensions shall be 400mm x 400mm forming a 2mm lip around the edges of a modular 397mm x 397mm block. Nominal 100mm standard block thickness shall be used as well as standard and special block shapes. Solid units shall be used throughout.

2.04 Concrete Masonry Cleaners

A. Use concrete masonry cleaners such as Vanatrol and Deox, carefully following manufacturer’s instructions.

B. CAUTION! The following solvents must never be used as they may damage ASTRA-GLAZE-SW block facings: paint remover, lacquer thinner, epoxy thinner, mthylene chloride, acetone, muriatic acid.

PART 3 - EXECUTION

3.01 Laying Concrete Masonry Walls

A. Draw concrete blocks from more than one pallet at a time during installation.

3.02 Installation

1. Lighting:provide adequate lighting for masonry work by placing all lighting a reasonable distance from the wall for even illumination. Do not use trough lighting.
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2. Base Course: Align base course properly on concrete substrate.

3. Cutting: Make all unit cuts, including those for bonding, holes, boxes, etc., with motor driven masonry saws, using either an abrasive or diamond blade. Cut neatly and locate for best appearance.

3.03 Workmanship

A. Lay ASTRA-GLAZE-SW blocks with the faces level, plumb and true to a line strung horizontally at the glazed face. Install only quality units; reject all defective units. Units shall have uniform joint dimensions of 6mm both horizontally and vertically. Tool joints neatly after they are finger-hard to make them straight and uniform. Size and place cut pieces appropriately to maintain consistency and bond. Complete masonry construction using procedures and workmanship consistent with the best masonry practices.

3.04 Inspection

A. The glazed facing shall be free from chips, cracks, crazes or any other imperfection that would detract from the overall appearance of the finished wall when viewed from a distance of 1.5 m at right angles to the wall with normal lighting.

3.05 Flashing of Masonry Work

A. Install flashing at locations shown in the plans and in strict accordance with the details and the best masonry flashing practices.

3.06 Weep Holes and Vents

A. Install weep holes and vents at proper intervals (813mm O.C. and 6.35mm wide, above bed joints, typical) at courses above grade, above flashing and at any water stops over windows, doors and beams.

3.07 Pointing

A. Tuckpoint the joints of all scored ASTRA-GLAZE-SW units. See Installation Recommendations.

3.08 Cleaning

A. Keep walls clean daily during installation using brushes or rags and a clean damp cloth. Harsh cleaning methods after walls have been erected may mar the surface of the blocks. Do not allow excess mortar lumps or smears to harden on
the glazed surfaces. Remove green mortar with a dry cloth. Do not use steel wool, sandpaper, or other abrasives.

3.09 Final Cleandown

A. Clean the completed walls with a detergent cleaner strictly following the manufacturer’s instructions including thorough rinsing. Do not use acid or abrasives on the glazed surfaces. See Masonry Cleaners.

3.10 Maintenance

A. ASTRA-GLAZE-SW units, properly installed and cleaned, need virtually no maintenance other than routine cleaning with standard commercial grade cleaning agents such as PINESOL or LESTOIL. Graffiti, paint or dye may need special cleaning methods and products. Contact manufacturer for specific cleaning recommendations.

Submittal Approvals

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<tr>
<td>1 1.03a</td>
<td>Manufacturers specifications and instructions and indication that copy was distributed to masonry contractor</td>
<td>Engineer</td>
</tr>
<tr>
<td>2 1.04a</td>
<td>203 mm X 203 mm Samples of each color</td>
<td>Designer</td>
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</tbody>
</table>

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END OF SECTION
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

SECTION 05500 - METAL FABRICATIONS

PART 1 GENERAL

1.01 Products Furnished But Not Installed Under This Section

A. Anchor Bolts: Installed under Section 03000.

1.02 Related Work Specified Elsewhere

A. Structural Steel: NYSDOT Standard Specification Section 564

B. Field Painting: Section 09900.

1.03 References

A. Except as shown or specified otherwise, the Work of this Section shall meet the requirements of the following:


a. Design and Fabrication of Cold-Formed Shapes: “Specification for the Design of Cold-Formed Steel Structural Members”, by the American Iron and Steel Institute (AISI Specification).


1.04 Submittals

A. Shop Drawings: Show application to project. Furnish setting drawings and templates for installation of bolts and anchors in other Work. Indicate shop and field welds by standard AWS welding symbols in accordance with AWS A2.4.

B. Product Data: Catalog sheets, specifications, and installation instructions for each fabricated item specified, except submit data for fasteners only when directed.
1.05 Quality Assurance

A. Galvanizing: Stamp galvanized items with galvanizer’s name, weight of coating, and applicable ASTM number.

1.06 Delivery and Storage

A. Coordinate delivery of items to be built into other construction to avoid delay.

B. Promptly cover and protect steel items delivered to the Site.

PART 2 PRODUCTS

2.01 Materials

A. Steel Shapes, Plates, and Bars: ASTM A 36.

B. Steel Bars and Bar-Size Shapes: ASTM A675, Grade 480; or ASTM A 36.

C. merchant Quality Steel Bars: ASTM A 575, grade as selected by fabricator.

D. Cold-Finished Steel Bars: ASTM A 108, grade as selected by fabricator.

E. Hot-Rolled Carbon Steel Sheet and Strip: ASTM A 569, pickled and oiled.

F. Cold-Rolled Carbon Steel Sheet: ASTM A 366, oiled.

G. Galvanized Steel Sheet: ASTM A 526, with G90 hot-dip process zinc coating complying with ASTM A 525.

H. Fasteners: Galvanized fasteners for exterior use or for anchorage of metal Work to exterior walls. If not indicated, use type, size, style, grade, and class as required for secure installation of metal fabrications. Except when shown, specified, or approved otherwise, furnish fasteners selected from the following:

2. Lag Bolts: FS FF-B-561, square head.
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8. Toggle Bolts: Tumble-wing type; FS FF-B-588, type, class and style as required to sustain load.
9. Stainless Steel Fasteners: Type 302/304 for interior Work; type 316 for exterior Work; Phillips flathead (countersunk) screws and bolts for exposed Work.

I. Anchors:

1. Concrete Inserts: Galvanized ferrous castings, ASTM A 47 or ASTM A 27; or galvanized pressed steel plate, ASTM A 283; type required for anchorage indicated.
2. Externally Threaded Expansion Bolt Anchors: FS FF-S-325, Group II, Type 4, Class 1.
3. Internally Threaded Expansion Shield Anchors (For Lag Bolts): FS FF-S-325, Group II, Type 1.
4. Internally Threaded Expansion Shield Anchors (For Machine Bolts): FS FF=S-325, Group II, Type 2.

J. Shop Paint (General): Steel primer selected from the following:

1. TNEMEC 10-99 (Red), 10-99G (Green) or 10-1009 (Gray).
2. Rust-Oleum 769.
4. Sherwin-Williams “Kromik”.

K. Shop Paint for galvanized Steel: FS TT-P-641, Type II.

L. Cold Galvanizing Compound: Single component compound giving 93 percent pure zinc in the dried film, and meeting the requirements of DOD-P-21035A (NAVY).

M. Bituminous Mastic: Cold applied asphalt mastic; SSPC – Paint 12.
2.02 Miscellaneous Framing and Supports

A. Fabricate metal framing and supports to support related items required by the Work. Fabricate of welded construction unless otherwise indicated. Preassembled to largest extent possible.

B. When required to be built into other Work, equip units with integral anchors spaced not more than 610mm on center.

C. Galvanize exterior steel framing and supports.

2.03 Miscellaneous Steel Trim

A. Fabricate trim of shapes, sizes, and profiles shown, with continuously welded joints and smooth exposed edges, unless otherwise indicated or approved. Use concealed field splices wherever possible. Furnish necessary cutouts, fittings, and anchorages.

B. Galvanize exterior steel trim.

2.04 Fabrication

A. Use materials of size and thickness indicated. If not indicated, use material of required size and thickness to produce adequate strength and durability for the intended use of the finished product. Furnish suitable, compatible anchors and fasteners to support assembly.

B. Fabricate items to be exposed to view of material entirely free of surface blemish, including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove surface blemishes by grinding or by welding and grinding prior to cleaning, treating, and finishing. Ease exposed edges to a radius of approximately 1mm inch unless otherwise shown.

C. Joints: Fabricate accurately for close fit. Weld exposed joints continuously unless otherwise indicated or approved. Dress exposed welds flush and smooth.

D. Connections: Form exposed connections with flush, smooth, hairline joints. Use concealed fasteners wherever possible. Use Phillips flathead (countersunk) bolts or screws for exposed fasteners, unless otherwise shown or specified.

1. Furnish flat washer under connections requiring raised bolt heads.
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

2. Furnish lock washer under nuts when through-bolting occurs.

E. Punch, reinforce, drill, and tap metal Work as required to receive hardware and other appurtenant items.

F. Galvanizing:

1. In addition to specific items specified or noted to be galvanized, galvanize items attached to, embedded in, or supporting exterior concrete masonry units (including interior wythe of exterior concrete walls) and concrete Work.

2. Unless otherwise specified or noted, items indicated to be galvanized shall receive a zinc coating by the hot-dip process, after fabrication, complying with the following:

   a. ASTM A 123 for plan and fabricated material, and assembled products.

   b. ASTM A 153 for iron and steel hardware.

G. Shop Painting:

1. Cleaning Steel: Thoroughly clean all steel surfaces. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1 “Solvent Cleaning”. Remove loose mill scale, loose rust, weld slag and spatter, and other detrimental material in accordance with SSPC SP-2 “Hand Tool Cleaning”, SSPC SP-3 “Power Tool Cleaning”, or SSPC SP-7 “Brush-Off Blast Cleaning”.

2. Galvanized Items:

   a. Galvanized items which are to be finish painted under Section 09900 shall be rinsed in hot alkali or in an acid solution and then in clear water.

   b. Welded and abraded areas of galvanized surfaces shall be wire brushed and repaired with a coating of cold galvanizing compound.
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3. Apply one coat of shop paint to all steel surfaces except as follows:
   a. Do not shop paint steel surfaces to be field welded and steel to be encased in cast-in-place concrete.
   b. Apply 2 coats of shop paint, before assembly, to steel surfaces inaccessible after assembly or erection, except surfaces in contact.
   c. Do no paint galvanized items which are not to be finished painted under Section 09900.

4. Apply paint and compound on dry surfaces in accordance with the manufacturer’s printed instructions, and to the following minimum thickness per coat:
   a. Shop Paint (General): 0.1 mm wet film.
   b. Shop Paint for Galvanized Steel: 0.75 mm wet film.
   c. Cold Galvanizing Compound: 0.5 mm dry film.

PART 3        EXECUTION

3.01 Preparation
   A. Temporarily brace and secure items which are to be built into concrete, masonry, or similar construction.
   B. Isolate non-ferrous metal surfaces to be permanently fastened in contact with ferrous metal surfaces, concrete, or masonry by coating non-ferrous metal surface with bituminous mastic, prior to installation.

3.02 Installation
   A. Fit and set fabricated metal Work accurately in location, alignment, and elevation. Securely fasten in place. Cut off exposed threaded portion of bolts flush with nut.
   B. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar or grout.
C. Attached Work: Fasten to concrete and solid masonry with expansion anchors and to hollow masonry with toggle bolts in cells, unless otherwise indicated. Drill holes for fasteners to exact required size using power tools.

END OF SECTION
PART 1 - GENERAL

1.01 Description Of Work

A. Provide material, labor, equipment, services to properly install sprayed fireproofing on members designated on the Drawings to receive it at a thickness that will yield the proper fire rating specified on the Drawings.

1.02 Related Sections And Work

A. Cast-in-Place Concrete fireproofing........Section 03300

B. Structural Steel.........................Section 05120

1.03 References

A. American Society of Testing and Materials (ASTM) standards, latest editions:

D2240 Standard Test Method for Rubber Property - Durometer Hardness


E859 Standard Test Method for Air Erosion of Sprayed Fire-Resistive
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

Materials Applied to Structural Members.


1.04 Design Requirements

A. Thickness of the sprayed fireproofing shall be such as to provide required fire rating in accordance with NYC Building Code and Drawings, but in no case less than .375". Ratings are shown on Drawings for members and assemblies.

1.05 Submittals

A. Product Data

Submit manufacturer's information on the material.

B. Quality Control Submittals

1. Design Data

a. For each type of material, submit thickness of material required to give proper fire rating for each type of assembly or individual member (such as inner angle of lintel assemblages, bracing members, columns, etc.) as prepared by the manufacturer.

b. For assemblies having limiting ratios such as W/D, submit table from the manufacturer listing the member, W/D ratio, and the thickness of material required to give the required fire rating. Provide manufacturer with complete set of Drawings to enable correct determination of required thickness for all members and assemblies. Indicate areas that require bonding adhesive for the given assemblies.

c. From list prepared by manufacturer, provide mark-up of framing plans indicating thickness and type of material for each member.
ITEM 11631.1405 M - ARCHITECTURAL FINISHES FOR FDR DRIVE

2. Test Reports

Submit independent laboratory test reports for the following performance criteria specified under each material. The preparation and conditioning of the laboratory test samples must be witnessed and fully described by a qualified independent testing laboratory.

a. Durometer Hardness per ASTM D2240.
b. Surface Burning Characteristics per ASTM E84.
c. Fire Resistance Rating of Assemblies per ASTM E119.
d. Bond Strength per ASTM E736.
e. Deflection per ASTM E759.
f. Bond Impact per ASTM E760.
g. Compressive Strength per ASTM E761.
h. Air Erosion per ASTM E859.
i. Corrosion Resistance per ASTM E937.

3. Certificates

a. Furnish manufacturer's certification that materials meet or exceed specification requirements.
b. Furnish applicator's certification that material has been completed as specified to meet fire resistance ratings, thickness requirements, and application requirements.
c. Furnish current BSA or MEA resolution for approval of material.

4. Manufacturer's Instructions: Furnish manufacturer's printed material, specifications, and application instructions for sprayed on fireproofing.
C. Guarantee

1. Contractor and installer's installation guarantee.

1.06 Quality Assurance

A. Qualifications

Applicator: Company specializing in the application of sprayed fireproofing materials shall have a minimum of three years experience and shall have worked on at least two projects with similar quantities of materials used. Applicator shall be acceptable to the sprayed fireproofing material manufacturer.

B. Regulatory Requirements

1. Building Code: Material and application shall meet the requirements for fire resistance ratings for areas to receive the sprayed fireproofing materials in accordance with the NYC Building Code.

2. Material must have NYC Board of Standards and Appeals (BSA) or NYC Materials and Equipment Acceptance (MEA) approval for the Underwriters Laboratories (UL) fire tested design assembly.

1.07 Delivery, Storage, And Handling

A. Deliver materials in original, unopened packages bearing name of manufacturer, product identification, and the proper UL labels for fire hazard and fire-resistance classification. The shipment or delivery of the material shall also be accompanied by a tag or label stating that the material has been approved for use by the BSA or MEA and containing the calendar number under which the material received BSA or MEA approval.

B. Reject damaged packages found unsuitable for use and remove from job site.

C. Store materials off ground, under cover, and away from damp surfaces.

D. Keep materials dry at all times. Wet material shall be discarded.

E. Rotate stock material and use prior to expiration date.
1.08 Environmental Requirements

A. Maintain air and substrate temperature at a minimum temperature of 40°F for 24 hours before, during, and for 24 hours after application of the sprayed fireproofing. Contractor shall provide enclosures with heat to maintain temperatures.

1.09 Guarantee

A. Submit a guarantee, executed by the Contractor and co-signed by the installer, agreeing to repair/replace fireproofing work performed under this Contract which has cracked, flaked, dusted excessively, peeled, or has fallen from the substrate due to defective workmanship for a period of two (2) years from the date of acceptance of the building.

PART 2 - PRODUCTS

2.01 Manufacturers

A. Manufacturer of the fireproofing material is required to have BSA or MEA approvals for the material for the required fire ratings of all assemblies and individual members used on this project. Listing herein shall not be construed as acceptance of the manufacturer's material without the BSA or MEA approval.


2. Isolatek International Flanders Road, Netcong, NJ 07857

2.02 Materials

A. Medium or High Density Sprayed Fire-resistive Material

1. Location: No Structural Steel members shall be exposed to the cavity in a cavity wall. All steel exposed to the cavity must be encased in concrete.

2. Material

a. Material shall comply with federal specification SS-S-IIIB or SS-SIIC

b. Products

1) Monokote Type Z106 by W.R. Grace. (Portland cement-based)
2) Monokote Type Z146 by W.R. Grace. (Portland cement-based)

3) Cafco 400 by Isolatek International (Not for use in a cavity or moist condition)

4) Cafco 800 by Isolatek International (Portland cement-based)

5) Cafco Blaze Shield II HP by Isolatek International. (Portland cement-based)

3. Material shall comply with the following performance test criteria, which shall be tested and reported by UL or approved lab in accordance with the procedures of ASTM E119:

   a. Density: Dry density of material shall have a minimum of 20 lb/ft³ or as listed in the BSA or MEA approval, whichever is greater. No reduction in average thickness is permitted when the density given in the BSA or MEA approval is less than 20 lb/ft³ and provides the required fire resistance.

   b. Deflection: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E759.

   c. Bond Impact: Material subject to impact tests in accordance with ASTM E760 shall not crack or delaminate from the surface to which it is applied.

   d. Bond Strength: Fireproofing, when tested in accordance with ASTM E736, shall have a minimum average bond strength of 1000 psf and a minimum individual bond strength of 750 psf.

   e. Air Erosion: Maximum allowable weight loss of the fireproofing material within a 24 hour period shall be 0.005 gm/ft² when tested in accordance with ASTM E859.

   f. Compressive Strength: The fireproofing shall not deform more than 10% when subjected to compressive forces of 10000 psi when tested in accordance with ASTM E761.
g. Corrosion Resistance: Steel with applied fireproofing shall be tested in accordance with ASTM E937 and shall not promote corrosion of steel.

h. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84.

1) Flame Spread........................0
2) Smoke Development....................0

i. Durometer Hardness: The fireproofing material shall have a minimum Durometer Hardness of 9 when tested in accordance with ASTM D2240.

3. Material shall not contain Asbestos of any form.

4. Material shall be tested in accordance with ASTM Standard G-21 and shall show resistance to mold growth when inoculated with aspergillus niger and mixed spore cultures (Tappi T487-M54 and ASTM G-21). Mold inhibitor shall be added by the manufacturer.

Sealer

1. Protective coating for fireproofing shall be a portland cement based material meeting the following characteristics:

a. Density: Dry density of the sealer material shall be a minimum of 40 lb/ft³ when tested in accordance with ASTM E605.

b. Penetration Resistance: The sealer material shall have a penetration resistance of .01" when tested in accordance with ASTM C569.

c. Compressive Strength: The sealer material shall not deform more than 10% when subjected to compressive forces of 500 psi when tested in accordance with ASTM E354.

d. Durometer Hardness: The sealer material shall have a minimum Durometer Hardness of 39 when tested in accordance with ASTM D2240.
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2. Product
   a. Topkrete Type 610 by W.R. Grace.
   b. Cafco 800 by Isolatek International.

C. Water

Mixing water shall be potable New York City water as per ACI 318 paragraph 3.4.

PART 3 - EXECUTION

3.01 Examination

A. Surfaces to receive sprayed fireproofing shall be free of oil, grease, dirt, paints/primers, loose materials, and other matter which may impair proper adhesion of the fireproofing material to the substrate. Do not begin application of fireproofing until the substrate is acceptable to receive the fireproofing material. Notify the Authority and Contractor in writing of any conditions that will prevent the proper completion of the Work.

3.02 Preparation Protection

A. Protection

1. Provide ventilation in area to receive sprayed fireproofing, introducing fresh air and exhausting air continuously during, and 24 hours after, application to promote the evaporation of water and optimum drying of applied material. Material must be substantially dry within 30 days of application.

2. Provide temporary enclosures to contain overspray.

3. Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting-off of sprayed fireproofing materials. Protect concrete and masonry surfaces exposed to view from overspray by using masks, drop cloths, or other satisfactory coverings.

4. Provide fire extinguisher and post caution signs warning against smoking and open flame when working with flammable materials.
5. Prevent entry by non-fireproofing personnel into spraying and mixing areas or other areas exposed to the wet material. Post signs such as "Slippery When Wet".

B. Surface Preparation

1. After acceptance of surfaces, maintain substrate clean of dirt, dust, grease, oil, loose material, frost, or other matter which would affect bond of sprayed fireproofing.

2. Clips, hangers, supports, sleeves, and other items required to penetrate the sprayed fireproofing shall be in place before installing fireproofing.

3. Equipment that would interfere with application of fireproofing shall not be positioned until sprayed fireproofing work is completed.

3.03 Application

A. Location of Fireproofing Material

1. Provide medium or high density portland cement-based sprayed fireproofing at the following locations:

   a. Perimeter steel (those steel members with entire unit or portions thereof are to avoid being exposed to the cavity)

B. Conform to the material manufacturer's application instructions for equipment and application procedure.

C. Patch and repair sprayed fireproofing surfaces damaged by other trades. Payment for such is the responsibility of the trades responsible for such damage.

D. Correct unacceptable work as determined by the Engineer for Controlled Inspection and the Engineer and pay for further testing required to prove acceptability of installation.

E. Patch areas from which testing samples have been removed to satisfy fire rating requirements.
3.04  Field Quality Control

A.  Tests

1.  The manufacturer’s certification from the testing laboratory will verify thickness and dry density of in-place material in accordance with ASTM E605 and verify bond strength in accordance with ASTM E736.

2.  Inspections and tests to be done by the testing laboratory as work progresses are as follows.
   a.  Visual inspection of substrate prior to application of fireproofing to verify surface preparation.
   b.  Three thickness tests on each size member (and each hourly resistance rating) for every 10000 sq. ft of floor area or portion thereof per floor, selected at random.
   c.  At least one density test on both beams and columns for every 10000 sq.ft of floor area or portion thereof, with a minimum of 6 tests (3 for beam, 3 for column) for each days work.
   d.  At least one bond strength test on both beams and columns for every 10000 sq.ft of floor area or portion thereof, with a minimum of 6 tests (3 for beam, 3 for column) for each days work.
   e.  Visual inspection of completed work including patches to cracking and spalling.

B.  Inspection

1.  Testing Laboratory
   a.  The Authority will engage an approved Testing Laboratory or Inspection Agency to inspect and perform the above tests.
   b.  The Testing Laboratory will be responsible to and under the supervision of the Licensed Professional Engineer designated for "Controlled Inspection".
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2. Engineer for Controlled Inspection
   a. The Engineer will assign, under the requirements of paragraphs 27-132 and 27-324(F) of the Building Code, a Licensed Professional Engineer to supervise the testing of the sprayed fireproofing.
   b. The Contractor, upon award of the Contract, will receive a signed statement stating that the Engineer designated for Controlled Inspection has assumed the responsibility for inspection of the sprayed fireproofing and will file all reports required by the Building Department.

3. Test Results: Results of above tests will be made available to all parties at completion.

4. When test results indicate fireproofing does not comply with the Contract requirements, additional random testing will be done within the testing area to determine the extent of noncompliance. This additional testing shall be paid for by the Contractor.

C. Nonconforming Fireproofing

1. When test results indicate fireproofing does not comply with the required density and/or bond strength, remove and replace fireproofing at no cost to the Authority.

2. If fireproofing is less than the required thickness, place additional material in accordance with the manufacturer's recommendations.

3. Areas of repair or replacement will be retested for compliance with the Specifications.

3.05 Cleaning

A. After completion of fireproofing work clean other surfaces not to be sprayed of any applied fireproofing material.

3.06 Protection

A. Protect applied fireproofing until permanent covering is installed or, where exposed, until final acceptance.
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END OF SECTION
PART 1 - GENERAL

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

1.02 Summary
A. This Section includes sheet metal flashing and trim in the following categories:
   1. Metal flashing.
   2. Reglets.
B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 4 Sections for through-wall flashing and other integral masonry flashings specified as part of masonry work.
   2. Division 5 Section "Expansion Joint Cover Assemblies" for metal expansion-joint covers.
   3. Division 7 Section "Joint Sealants" for elastomeric sealants.

1.03 Performance Requirements
A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

1.04 Submittals
A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
B. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.

C. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.

D. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.

1. 8-inch- (200-mm-) square Samples of specified sheet materials to be exposed as finished surfaces.

2. 12-inch- (300-mm-) long Samples of factory-fabricated products exposed as finished Work. Provide complete with specified factory finish.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.05 Quality Assurance

A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Mockups: Prior to installing sheet metal flashing and trim, construct mockups indicated to verify selections made under Sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.

1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Notify Architect one week in advance of the dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Construct mockups of sheet metal flashing and trim:
5. Obtain Architect's approval of mockups before start of final unit of Work.
6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   a. When directed, demolish and remove mockups from Project site.
   b. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.06 Project Conditions
A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.01 Metals
A. Stainless-Steel Sheet: ASTM A 167, Type 304, soft annealed, with No. 2D finish, except where harder temper is required for forming or performance; minimum 0.0187 inch (0.5 mm) thick, unless otherwise indicated.

2.02 Concealed Through-Wall Sheet Metal Flashing
A. Material: Fabricate from the following metal:
   1. Stainless Steel: 0.0156 inch (0.4 mm) thick.
   2. Fabricate through-wall metal flashings embedded in masonry as follows:
      a. With ribs formed in dovetail pattern at 3-inch (75-mm) intervals along length of flashing to provide a 3-way integral mortar bond and weep-hole drainage.
      b. With ribs formed in sawtooth pattern at 3-inch (75-mm) intervals along length of flashing to provide a 3-way integral mortar bond and weep-hole drainage.

B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
C. Products: Subject to compliance with requirements, provide one of the following:
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1. Cheney Flashing (Dovetail); Cheney Flashing Company, Inc.
2. Cheney Flashing (Sawtooth); Cheney Flashing Company, Inc.

2.03 Reglets

A. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.

B. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.

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

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

1. Fry Reglet Corporation.
2. Cheney Flashing Company.

2.04 Miscellaneous Materials And Accessories

A. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.

B. Stainless-Steel Welding Rods: Type recommended by stainless-steel sheet manufacturer for type of metal sheets furnished.

C. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

D. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."
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E. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

F. Paper Slip Sheet: 5-lb/square (0.244 kg/sq. m) red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.

G. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15-mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.

H. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

2.05 Fabrication, General

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.

E. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

G. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not
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allowed on faces of sheet metal exposed to public view.

I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.06 Sheet Metal Fabrications

A. Thru-Wall Flashing and trim: Fabricate from the following material:
   1. Stainless Steel: 0.0187 inch (0.5 mm) thick.

B. Flashing Receivers: Fabricate from the following material:
   1. Stainless Steel: 0.0156 inch (0.4 mm) thick.

C. Drip Edges: Fabricate from the following material:
   1. Stainless Steel: 0.0156 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.01 Examination

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 Installation

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.

1. Do not solder the following metals:
   a. Aluminum.
   b. Coil-coated galvanized steel sheet.

2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

E. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

1. Use joint adhesive for nonmoving joints specified not to be soldered.

F. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams.

G. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.


H. Install reglets to receive counterflashing according to the following requirements:
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1. Where reglets are shown in concrete, furnish reglets for installation under Division 3 Section "Cast-in-Place Concrete."

I. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches (50 mm) and bed with sealant.

3.03 Cleaning And Protection

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION

SECTION 07900 - JOINT SEALERS

PART 1 GENERAL

1.01 Submittals

A. Product Data: Catalog sheets, specifications, and installation instructions for each product specified except miscellaneous materials.

B. Samples:
1. Sealants: One pint or standard tube.


3. Bond Breaker Tape: 610mm long section.

1.02 Quality Assurance

A. Container Labels: Include manufacturer’s name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable) and packaging date or batch number.

1.03 Project Conditions

A. Environmental Requirements:

1. Temperature: Unless otherwise approved or recommended in writing by the sealant manufacturer, do not install sealants at temperatures below 5 degrees Centigrade or above 30 degrees Centigrade.

2. Humidity and Moisture: Do not install the Work of this Section under conditions that are detrimental to the application, curing, and performance of the materials.

3. Ventilation: Provide sufficient ventilation wherever sealants, primers and other similar materials are installed in enclosed spaces. Follow manufacturer’s recommendations.

B. Protection:

1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.

2. Protect all other surfaces in the Work area with tarps, plastic sheets or other approved coverings to prevent defacement from droppings.

PART 2 PRODUCTS

2.01 Sealants
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A. Type 1 Sealant, any of the following generic types:

1. One-part, low modulus, silicone sealant: Dow Corning’s 790, General Electric’s Silpruf, Pecora’s 864, or Sonneborn’s Omniseal.

2. One-part, non-sag polyurethane sealant: Pecora’s Dynatrol I, Sika’s Sikaflex la, Sonneborn’s Sonolastic NP I, or Tremco’s DyMonic.

B. Sealant Colors: For exposed materials provide color as selected by the Engineer from manufacturer’s standard colors. For concealed materials, provide the natural color which has the best overall performance characteristics.

2.02 Miscellaneous Materials

A. Joint Primer/Sealer/Conditioner: As recommended by the sealant manufacturer for the particular joint surface materials and conditions.

B. Backer Rod: Compressible rod stock of expanded, extruded polyethylene.

C. Bond Breaker Tape: Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self adhesive where applicable.

D. Cleaning Solvents: oil free solvents as recommended by the sealant manufacturer. Do no use re-claimed solvents.

E. Masking Tape: Removable paper or fiber tape, self-adhesive, non-staining.
PART 3 EXECUTION

3.01 Examination

A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.02 Preparation

A. Clean joint surfaces immediately before installation of sealant. Remove lacquers, protective coatings and similar materials from joint faces with manufacturer’s recommended and approved solvents.

B. Priming Joint Surfaces:

1. Prime joints if so recommended by the manufacturer’s printed instructions.

2. Do not allow the primer/sealer to spill or migrate onto adjoining surfaces.

3.03 Joint Backing Installation

A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.

B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

3.04 Sealant Installation

A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer’s printed instructions.

B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impractical, apply sealant with knife.

C. Finishing: Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat, smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by
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the manufacturer.

1. Use tool wetting agents as recommended by the sealant manufacturer.

3.05 Cleaning

A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.

B. After sealants are applied and before skin begins to form on sealant, remove all masking; and other protection and clean up any remaining defacement caused by the Work.

Submittal Approvals

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<td>1.01B</td>
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</tbody>
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Note:
1. This table does not include approvals for “or-equal” proposals. Approvals for “or-equal” proposals are covered in NYSDOT Standard Specification Section 100.

END OF SECTION
1.0 GENERAL REQUIREMENTS

1.01 Scope Of Work
   a. The Contractor shall furnish all labor, materials, tools and equipment necessary for the installation of non-insulated steel rolling service doors as indicated on Contract Drawings and specified herein as directed by the Engineer.

1.02 Related Work
   a. Structural Metal shall be as specified in Section 05120.
   b. Miscellaneous Metal shall be as specified in Section 05500.
   c. Sealants shall be as specified in Section 07900.
   d. Painting shall be as specified in Section 09900.

1.03 General
   a. All work shall, as far as practicable, be built up and assembled in the shop and shall conform to actual measurements taken by the Contractor at the work site. All work shall be plumb and true and in conformity with the details shown on the Contract Drawings and in accordance with industry standards and the best modern practice.

1.04 Quality Assurance
   a. Products used shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the Engineer.
   b. All components of the door, including electrical operators, controls and accessories shall be by the same manufacturer.
c. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. United Steel Products
2. McKeon Rolling Steel Doors Company
3. Raynor Rolling Doors
4. Cornell Iron Works

1.05 Submittal Requirement

a. Manufacturer's product data and installation instructions indicating compliance with specifications.

b. Three copies of operations and maintenance manuals and parts list.

c. Shop Drawings in accordance with contract documents.

2.0 MATERIALS

2.01 Description

a. Roll-up door shall conform to requirements of ANSI/UL

b. The steel rolling doors shall be non-insulated Series Model LFF Manual Operating Door, and large motorized steel rolling door, as manufactured by Raynor Garage Door or approved equal.

c. Series Model LFF slats, with flat vertical exterior surface, shall be not less than 20 gauge. Interior surface shall be 20 gauge, prime painted, hot dipped, galvanized steel cover. The door shall be provided with a vinyl jamb seal and rubber hood baffle as standard.

d. The large rolling door shall be motorized and shall be provided with a motor and controllers for independent electrical operation.

e. All equipment and features shall be suitable for heavy duty 100,000 (minimum) cycle operation for the large motorized rolling door.
2.02 Materials For Rolling Door

CURTAINS:

a. The curtain shall be roll-formed of (galvanized steel) interlocking slats of design to resist wind pressure of 20 pounds per square foot. Slats shall be flat slats of the manufacturers standard design. Steel slats shall be (G-60 minimum) hot dipped galvanized steel conforming to ASTM A-924 and ASTM A-653. and are prime painted with an epoxy primer and a finished gray polyester.

b. The ends of each slat shall be equipped with malleable iron weatherlocks to serve as wearing surfaces in the guides and to prevent horizontal slat movement. The bottom of the curtain shall be reinforced with a minimum of two 1 ½” x 1 ½” x 1/8” angles with a single contact type bottom astragal. The large motorized rolling door (4.267 m Wide) must contain an electric safety edge sensor to reverse upon hitting an obstruction when closing.

GUIDES:

a. Guides shall be fabricated of three standard structural steel angles not less than 3/16” thick. Depth of guides is to be sufficient to retain the curtain under the wind pressure specified.

b. The guide angles shall be assembled by means of 3/8” bolts. The guide assembly is to be bolted to the jambs, set plumb using 3/8” bolts not over 30” on centers.

c. Guides shall be furnished with continuous weather-stripping inside a metal retainer. Weather-stripping shall be in contact with the curtain at all times.

BARREL:

a. The barrel shall be 4-1/2” O.D. x 0.120 wall structural steel pipe ASTM A500 or ASTM A1120. Deflection of pipe under full load shall not exceed 0.03” per foot of span

b. The spring and barrel assembly shall be designed to permit easy access to counterbalance assembly.
COUNTERBALANCE:

a. The curtain shall be counterbalanced by means of oil tempered, helical torsion springs, grease packed and mounted on a single continuous steel torsion shaft of a design to properly counter-balance the curtain. Springs shall be compression spring, of design to facilitate any counterbalance maintenance. The spring tension adjustment is to be by means balancing wheel on the outside of one of the bracket plates.

BRACKET PLATES:

a. Bracket plates shall be fabricated of steel plate not less than 10 gauge in thickness and attached to the wall angle of the guide assembly with ½” diameter Class 5 hardened bolts. The bracket shall support the shaft and form an end closure for the hood. The ends of the shaft shall be supported by sealed ball bearings of sufficient capacity for the shaft and curtain loading.

b. Bracket to be provided with angles to which the hood is to be fastened.

HOOD:

a. The hood shall be fabricated of not lighter than 24 gauge prime painted hot dipped galvanized steel with rolled edges. A reinforced neoprene weatherseal shall be provided extending the entire length of the hood, resting on the curtain to minimize air infiltration.

FINISH:

a. The curtain shall come, prime painted with an epoxy primer and finished with a coat of gray polyester by the manufacturer. The curtain and frame shall be painted in the field by the Contractor with two coats of enamel in accordance with requirements specified in Section 9900-PAINTING and as indicated on Contract Drawings. All non-plated components of the door shall receive one coat of rust inhibitive primer.

2.03 Operation of Small Rolling Manual Door

a. Manual operation to be provided with inside lift handle and locking bar (padlock by others) Chain operation shall be by means of reduction gears and galvanized hand chain. Lock.
2.04 Automatic Closure of Large Rolling Door

a. Where indicated on the Contract Drawings, automatic closing to be initiated by melting at 165 degrees F fusible link. Operation mechanism will be disengaged during automatic closing of the door with the rate of descent controlled by a governor.
b. Automatic closing shall also be activated by a methane detector, elsewhere specified and installed as part of the system.

2.05 Motor Operator of Large Rolling Door

a. Door shall be equipped with a motor operator of the jackshaft type.
b. Motors shall be sized as required by door size but not less than 3/4 horsepower nor more than 1/4 horsepower more than the size recommended by manufacturer for high frequency use. Motor shall not be operated at a maximum capacity. Where motor would be at its maximum capacity next larger motor shall be used.
c. Motor shall have high starting torque. Door shall be driven by roller chain to provide door travel of six (6) inches to twelve (12) inches per second in both open and closed directions.
d. Motor shall contain enclosed continuous duty magnetic solenoid brake for positive stop.
e. Motor shall be self-locking and capable of holding the door in any position in event of counter-balancing spring failure.
f. Speed reducer shall be high grade worm gear type, completely housed and running in an oil bath with additional reduction by chain and sprockets. Reducer shall have capacity for intended use. Motor shall be separate from reduction mechanism for ease of maintenance.
g. Starter shall be a NEMA standard mechanical interlocked reversing magnetic motor starter sized and rated for the motor and equipped with over-current protection. All electric components shall be in NEMA 1 enclosure.
h. Limit switch controlling door travel shall be positive chain drive screw type, enclosed in an electrical control box, easily accessible for precision setting. Limit switches will remain in time when emergency chain hoist is used and door is operated manually.
i. Motor shall be wall or bracket mounted as required by field space conditions and as approved. "Ramjet" type and/or tension connections shall not be permitted.
j. Electrical interlock shall be provided to prevent starting of motor during hand operation of door.
k. The motor supply shall be terminated in a junction box.
l. An adjustable friction clutch shall be provided to protect door and operator if door movement is obstructed.
m. Provide manual reset for overload protection.
n. All control wiring shall be 24 volt for safety.
2.06 Criteria For Motor And Operator

a. Horse power, type of wiring and spring cycles shall be as determined by the manufacturer for door size as approved by the Engineer.

2.07 Electrical Requirements For Large Motorized Rolling Door

a. The rolling door shall be specified with the following electrical requirements:

  Voltage  208/120V, 3 phase, 4 wire, 60Hz,

  Motor and other electrical equipment shall be suitable for Class 1, Division 1, Group D.

3.0 CONSTRUCTION METHODS

3.01 Installation

a. Steel rolling manual door and motorized door and all related equipment and materials necessary to run motorized rolling door shall be erected and installed by an authorized distributor of the products being supplied and in accordance with the manufacturer's recommendations. For motorized door, the Contractor shall provide the wiring and power to all electrical devices including to the control station.

b. Fasten assembly to wall construction and building framing without distortion or stress.

c. Brace securely components suspended from structure. Secure guides to structural members only.

d. Coordinate installation of sealant and backing materials at frame perimeter as specified in section 7900.

e. Erection tolerances shall be as follows:

  1. Maximum variation from plumb: 1/16 inch for door height.
  2. Maximum variation from level: 1/16 inch for door width.
  3. Longitudinal or diagonal warp: Plus or minus 1/8 inch per 10 feet.
3.02 Tests

a. The Contractor shall make such tests as may be necessary, and as the Engineer may require, to demonstrate that the equipment, as installed, complies with the contract requirements. He shall provide all labor, instruments and apparatus required for such tests. If any of the equipment fails, under test, to meet the contract requirements or to function properly, the defects shall be rectified until, under test, the requirement are met. The Authority may check the Contractor's instrument or to furnish its own instruments.

b. The Contractor shall also demonstrate, to the Engineer's satisfaction, the operation of the hand chain mechanism with the motor operator in place.

c. Power for motorized door to be provided in the future.

d. All tests shall be performed after the electrical work is completed.

3.03 Coordination

a. Locate and coordinate the installation of all supports that are to be fastened with the construction work of other trades.

3.04 Operation of Large Rolling Motorized Door

a. The operation of the door shall be by means of a motor operator. The motor operator shall consist of an integral enclosed assembly with a high starting torque thermal protected motor, worm type gear reducer fully enclosed and operating in an oil bath, limit switch, solenoid brake, emergency hand chain engaged from floor with disconnect lever, electrical cutout switch to prevent motor operation during chain operation, reversing magnetic contactor and push button station marked "Open", "Close" and "Stop".

b. The motor operator shall be designed to allow removal of the motor without affecting the chain operation or the limit switch setting.

c. A safety edge shall be provided to stop the door in the event the door strikes an obstruction when closing.

d. Locking of the emergency hand chain shall be by means of a lock mounted to the door guide. The chain lock shall be suitable for padlocking.
3.05 Door Controls of Large Rolling Door

a. The door controls shall include, one set of auxiliary contacts and accessible terminals to be used for remote control (opening and closing) and another set of contacts and terminals for remote monitoring functions as described elsewhere in the Contract specifications and shown on the Contract Drawings.

3.06 Emergency Manual Door Operation

a. Emergency manual door operation shall be by hand chain. Maximum required pull on chain shall not exceed thirty-five (35) pounds.

b. The chain gear mechanism shall be independent of the motor and shall allow removal of the motor without disturbing the limit switch timing.

c. Engagement of the chain gear shall be by control lever, or other approved device located within easy reach from floor level. Control lever shall disengage power operator, release the brake, cut-off current and engage the emergency operator for manual operation.

d. Hand chain shall consist of heavily galvanized lock link chain of a design and strength to prevent stretching. All ends shall be rounded to assure smooth operation and hand protection.

e. Hand chain holder with capacity to lock chain in place shall be provided for manual operating door and motor operating door holder shall be mounted on guide.
### Submittal Approval

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<tr>
<th>Paragraph No.</th>
<th>Submittal</th>
<th>Approval By (Engineer or Designer)</th>
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<tr>
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<td>1.5a Product specifications installation instructions material data safety sheets, compliance with specifications and standards</td>
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<td>2</td>
<td>1.5b Maintenance manuals</td>
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<td>1.5c Shop Drawings</td>
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**Notes:**

1. This table does not include approvals for “or-equal” proposals. Approvals for “or-equal” proposals are covered in Information For Bidders, Paragraph 9 and Specification Section 1B, Paragraph 1.38.

2. This table does not include approvals for Operation and Maintenance Manuals. For submittal requirements and approval of manuals refer to Specification Section 1L

**END OF SECTION**
SECTION 09310 - CERAMIC TILE

PART 1 - GENERAL

1.01 Description Of Work Specified

A. Custom wall tile in patterns shown on the Contract Documents.

1.02 References

A. Tile Manufacturing Standard: Comply with the requirements of ANSI A 137.1.

B. Installation Standards: Comply with the requirements of ANSI Specifications for the Installation of Ceramic Tile, except as shown or specified otherwise.

1.03 Submittals

A. Product Data: Specifications and installation instructions for the following:

1. Each type of tile and trim unit.
2. Setting materials and membrane.

B. Samples:

1. Tile and Grout: Each type and color required; 304mm x 304mm samples with tile mounted on plywood or hardboard panels and grouted.
2. Trim Units: Each type and shape required.
3. Color Samples:

   a. Tile manufacturer’s standard range of colors and textures for each tile type required.

   b. Grout manufacturer’s standard range of colors for each grout type required.

4. Submit artwork for approval prior to fabrication of custom units.
C. Quality Control Submittals:

1. Tile Grade Certificates: Furnish tile manufacturer’s Master Grade Certificate bearing the manufacturer’s certification for each shipment of tile.

D. Contract Closeout Submittals:

1. Maintenance Data: Tile and grout manufacturer’s recommended cleaning and stain removal methods and materials.

1.04 Quality Assurance

A. Manufacture:

1. Furnish tile of the same manufacturer and from the same origin for each tile type and color.

2. Furnish setting materials and grouting materials of the same manufacturer and from the same origin for each tile type and method of installation, whenever possible.

B. Certifications:

1. Tile manufacturer’s grade certification for each shipment of tile.

1.05 Delivery, Storage And Handling

A. Deliver and store packaged materials in original, unopened containers with grade seals unbroken and manufacturer’s labels intact until time of use. Store and handle materials in a manner to prevent damage or contamination by water, freezing, or foreign matter. Comply with material manufacturer’s environmental requirements.

1.06 Project Conditions

A. Environmental Requirements: Set and grout tile when ambient temperature is 10 degrees C (50 degrees F) or higher unless otherwise specifically recommended by the material manufacturer.
1.07 Maintenance

A. Extra materials: Furnish extra tile, equal to 2 percent of the tile installed, of each type and color of tile required. Also furnish a proportionate number of trim units. Place extra materials in storage at the site where directed.

PART 2 - PRODUCTS

2.01 Tile

A. Glazed Porcelain Ceramic Tile: Complying with section 5.1, ANSI A 137.1; Standard Grade.

1. Edge: Cushion.
3. Type: Porcelain, impervious.
4. Coefficient of Friction – 0.6 min.
5. Through body colors.

   a. Marazzi Tile
   b. American Olean
   c. Crossville Ceramics
   d. Summitville tiles

B. Colors:

Tile colors shall be as indicated on the Drawings, or if not indicated, as selected by the Architect from tile manufacturer’s standard range of colors.

2.02 Setting Materials

A. Latex-Portland Cement Mortar: Complying with ANSI A 118.4.

B. Water proof membrane sheet or liquid: Complying with ANSI A118.10.

C. Primer: As recommended by the mortar/adhesive manufacturer.
2.03 Grouting Materials

A. Commercial Portland Cement Grout: Compound of Portland cement and additives, factory blended to decrease shrinkage and increase moisture resistance, and complying with ANSI A 118.6.

B. Colors:
   1. As shown on the Contract Drawings.

2.04 Miscellaneous Materials

A. Metal Edge/Divider Strips: Zinc alloy or stainless steel, 3mm wide at top, with integral provision for anchorage to mortar bed or substrate.

B. Expansion Joint Materials:
   1. Sealants:
      a. Traffic Areas: polyurethane sealant with a Shore A hardness greater than 35; Federal Specification TT-S-00227 or TT-S-00230, Type I.
      2. Back-up Strip: Non-staining, flexible and compressible type of closed cell foam polyethylene or butyl rubber compatible with sealants used.

PART 3 - EXECUTION

3.01 Examination

A. Examine the substrates and the conditions under which tile is to be installed. Do not proceed with the tilework until unsatisfactory conditions have been corrected.

3.02 Preparation

A. Protection: Protect adjacent surfaces before tilework begins.

B. Cleaning: Clean substrate surfaces in accordance with applicable reference standards and manufacturer’s installation instructions.
3.03 Installation

A. Install the Work of this Section in accordance with ANSI A 108.1 thru ANSI A 108.7, as applicable for type of tile and method of installation, and in accordance with the printed installation instructions of the tile and setting material manufacturers.

1. Neutralize and seal substrate as required by the mortar/adhesive manufacturer’s instructions.

2. Mix and apply proprietary setting and grouting materials in compliance with the manufacturer’s instructions.

B. Setting Beds:


C. Joint Pattern: Install tile with 6.35mm joint width, unless otherwise indicated.

D. Extend tilework into recesses in concrete barrier (parapet). See drawings for location. Terminate tilework neatly at obstructions, edges, and corners without disruption of pattern or joint alignments.

E. Expansion and Control Joints: Comply with preparation, joint depths and widths, and installation requirements in the ANSI installation specifications. Keep expansion and control joints free of setting and grouting materials.

1. Install continuous expansion joint as indicated on drawings.

2. Install sealants in accordance with manufacture’s printed instructions.

F. Grouting: Comply with ANSI A 108.10 or 108.6, as applicable, and manufacturer’s installation instructions. Make joints watertight, and without voids, cracks and excess grout. Damp cure in accordance with reference standards and manufacturer’s instructions when applicable.
3.04 Field Quality Control
   A. Controlled Inspection.

3.05 Adjusting
   A. Check the tilework installation. Remove defective tile and retile. Leave finished installation free of cracked, chipped, broken, unbonded, and otherwise defective tilework.

3.06 Cleaning
   A. Clean tile after grouting. Comply with grouting specifications and with grout manufacturer’s printed instructions for materials and method.

3.07 Protection
   A. Apply heavy kraft paper, or other approved heavy protective covering, masked in place over tilework to prevent surface damage.

END OF SECTION
1.01 Related Work Specified Elsewhere

A. Rolling Service Doors: Section 08330

B. Access Doors

1.02 Submittals

A. Product Data: Manufacturer’s technical information, label analysis, and application instructions for each material proposed for use.

1. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer’s catalog number and general classification.

B. Samples for verification purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.

1. Provide a list of materials and application for each coat of each sample. Label each sample as to location and application.

2. Submit sample on the following:

   a. Ferrous Metal: Provide two 100mm square samples of flat metal and two 200mm long samples of solid metal for each color and finish.

1.03 Quality Assurance

A. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request,
furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Engineer of problems anticipated using the materials specified.

C. Material Quality: Provide the manufacturer’s best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer’s product identification will not be acceptable.

1. Federal Specifications establish a minimum quality level for paint materials, except where other product identification is used. Provide written certification from the manufacturer that materials provided meet or exceed these criteria.

2. Products that comply with qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to the Architect. Furnish material data and manufacturer’s certificate of performance to Architect for proposed substitutions.

1.04 Delivery, Storage And Handling

A. Deliver materials to the job site in the manufacturer’s original, unopened packages and containers bearing manufacturer’s name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Federal Specification number, if applicable.
4. Manufacturer’s stock number and date of manufacture.
5. Contents by volume, for pigment and vehicle constituents.
6. Thinning instructions.
7. Application instructions.
8. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 7 deg C (45 deg F). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily
rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.05 Job Conditions

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperature are between 10 deg C (50 deg F) and 32 deg C (90 deg F).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 7deg C (45 deg F) and 35 deg C (95 deg F).

C. Do not apply paint in snow, rain, fog, or mist, when the relative humidity exceeds 85 percent, at temperatures less than 3 deg C (5 deg F) above the dew point, or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application drying periods.

PART 2 PRODUCTS

2.01 Acceptable Manufacturers

A. Manufacturer: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to:

    Benjamin Moore and Co.
    The Glidden Company
    PPG Industries Inc., Pittsburgh Paints
    Pratt and Lambert (P & L)
2.02 Exterior Paint Systems

See structural drawings and manufacturer’s specification on painting of exterior steel rolling doors.

2.03 Interior Paint Systems

A. See Manufacturer’s specification on painting interior steel rolling doors.

PART 3 EXECUTION

3.01 Examination

A. Examine substrates and conditions under which painting shall be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.

1. Start of painting shall be construed as the Applicator’s acceptance of surfaces and conditions within a particular area.

3.02 Preparation

A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted. Remove these items for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

1. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process shall not fall on wet, newly painted surfaces.

B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer’s instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat material substrates primed by others.

2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
   a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
   b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer’s printed directions.

3. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shopcoated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
   a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
   b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

4. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
C. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer’s directions.

1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3. Use only thinners approved by the paint manufacturer, and only within recommended limits.

D. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 Application

A. Apply paint in accordance with manufacturer’s directions. Use applicators and techniques best suited for substrate and type of material being used.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

1. Paint colors, surface treatments, and finishes as indicated in “finish schedules”.

2. Provide finish coats that are compatible with primers used.

3. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer’s directions.
4. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

5. The term “exposed surfaces” includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.

6. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

7. Paint back sides of access panels and removable or hinged covers in the event that they are used.

8. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.

9. Sand lightly between each succeeding enamel or varnish coat.

10. Omit primer on metal surfaces that have been shop-primed and touch up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
D. Minimum Coating Thickness: Apply materials at not less than the manufacturer’s recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.

E. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in occupied spaces.

F. Electrical items to be painted include but are not limited to:
   1. Conduit and fittings
   2. Switchgear

G. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

H. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

I. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.

J. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.04 Field Quality Control

A. The State reserves the right to invoke the following test procedure at any time and as often as the State deems necessary during the period when paint is being applied:

   1. The State will engage the services of an independent testing laboratory to sample the paint material being used. Samples of material delivered to the
project will be taken, identified, sealed, and certified in the presence of the Contractor.

2. The testing laboratory shall perform appropriate tests for the following characteristics as required by the State:

   a. Quantitative materials analysis
   b. Abrasion resistance
   c. Apparent reflectivity
   d. Flexibility
   e. Washability
   f. Absorption
   g. Accelerated weathering
   h. Dry opacity
   i. Accelerated yellowness
   j. Recoating
   k. Skinning
   l. Color retention
   m. Alkali and mildew resistance

3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are noncompatible.

3.05 Cleaning

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. Upon completion of painting, clean paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.
3.06 Protection

A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or repairing or replacing, and repainting, as acceptable to the Architect.

B. Provide “wet paint” signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION