

SECTION 055000 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire Escapes.
2. Shelf angles.
3. Metal ladders.
4. Metal bollards.
5. Ladder safety cages.
6. Miscellaneous steel trim.
7. Structural-steel door frames.
8. **[Pipe] [Downspout]** guards.
9. Security bars, grilles and gates,
10. Fall Prevention Window Guards.
11. Loose bearing and leveling plates.
12. Miscellaneous steel framing and supports.
13. Abrasive metal **[nosings] [treads] [and] [thresholds]**.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete.

C. Related Sections:

1. Section 033000 – Cast-in-Place Concrete.
2. Section 042000 – Unit Masonry.
3. Section 083326 – Overhead Coiling Grilles.
4. Section 089119 – Fixed Louvers.
5. Section 089516 – Wall Vents.
6. Section 099113 – Exterior Painting.
7. Section 099123 – Interior Painting.
8. Section 102113.13 – Metal Toilet Partitions

D. Reference and Industry Standards

1. The following reference standards are applicable to this Section:
 - a. New York City Building Code, **current** edition, as amended.
 - b. New York City Fire Code, **current** edition, as amended.
 - c. New York State Multiple Dwelling Law, **current** edition, as amended.

- d. 2020 Enterprise Green Communities Criteria, 15th Anniversary edition and the 2020 New York City Overlay dated April 6, 2020.
 - e. Window Guard Regulations established by the Rules of the City of New York, Title 24 Department of Health and Mental Hygiene, Chapter 12 Window Guards §12-10 Specifications for Window Guards for Double Hung Windows, and §12-11 Specifications for Window Guards for Other Than Double Hung Windows.
2. Industry Standards:
 - AISC (American Institute of Steel Construction)
 - ANSI (American National Standards Institute)
 - ASTM (American Society for Testing and Materials)
 - MFMA (Metal Framing Manufacturers Associations)
 - SSPC (Society for Protective Coatings)
- E. The NYC Overlay of the 2020 Enterprise Green Communities Criteria
1. Mandatory Requirements: See the NYC Overlay of the 2020 EGC reference standards for full specifications.
 - a. All projects must achieve compliance with the mandatory criteria measures that are applicable:
 - Criterion 6.10: Construction Waste Management
 2. Optional Project Requirements for Certification Points
 - a. Additionally, rehab projects are required to achieve **55** optional points. Criteria with optional points related to this Specification Section include, but may not be limited to:
 - Criterion 6.2: Recycled Content and Ingredient Transparency
 - Criterion 6.5 : Environmentally Responsible Material Selection
 - Criterion 6.7: Regional Materials
 - Criterion 6.10: Construction Waste Management
- 1.2 PREINSTALLATION MEETINGS
- A. Preinstallation Conference: Conference to be conducted at Project site.
- 1.3 ACTION SUBMITTALS
- A. Product Data: For all products.
 - B. Shop Drawings: Show fabrication and installation details. [**Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.**]
- 1.4 INFORMATIONAL SUBMITTTALS

- A. Documentation for compliance with Enterprise Green Communities Criteria.
- B. Window Guards:
 - 1. Two (2) copies of manufacturer's catalog cut.
 - 2. Two (2) copies of manufacturer's installation instructions.
 - 3. Two (2) copies of the appropriate page from the most recent edition of the NYC Department of Health's Window Guard and Policy Acceptance Board Approved Manufacturers List highlighting the model number and approval number of the proposed window guard for the type of windows that are installed (or will be installed) in the target building.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Aluminum Ladders: Ladders [, **including landings,**] shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36.
- C. Stainless Steel Bars and Shapes: ASTM A276, Type 304.
- D. Rolled-Steel Floor Plate: ASTM A786, rolled from plate complying with ASTM A36 or ASTM A283, Grade C or D.
- E. Rolled-Stainless Steel Floor Plate: ASTM A793.
- F. Abrasive-Surface Floor Plate: Steel plate [**with abrasive granules rolled into surface**] [**or**] [**with abrasive material metallically bonded to steel**].
- G. Steel Tubing: ASTM A500, cold-formed steel tubing.
- H. Steel Pipe: ASTM A53, Standard Weight (Schedule 40) unless otherwise indicated.
- I. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: [**1-5/8 by 1-5/8 inches**] [**As indicated**] <Insert size>.
 - 2. Material: Galvanized steel, ASTM A653, [**commercial steel, Type B**] [**structural steel, Grade 33**], with G90 coating; [**0.108-inch**] [**0.079-inch**] [**0.064-inch**] nominal thickness.

3. Material: Cold-rolled steel, ASTM A1008, [**commercial steel, Type B**] [**structural steel, Grade 33**]; [**0.0966-inch**] [**0.0677-inch**] [**0.0528-inch**] minimum thickness; [**unfinished**] [**coated with rust-inhibitive, baked-on, acrylic enamel**] [**hot-dip galvanized after fabrication**].
- J. Cast Iron: Either gray iron, ASTM A48, or malleable iron, ASTM A47, unless otherwise indicated.
- K. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- L. Aluminum-Alloy Rolled Tread Plate: ASTM B632, Alloy 6061-T6.
- M. Aluminum Castings: ASTM B26, Alloy 443.0-F.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 1. Provide stainless steel fasteners for fastening [**aluminum**] [**stainless steel**].
- B. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47 malleable iron or ASTM A27 cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329.
- C. Post-Installed Anchors: Torque-controlled expansion anchors.
 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy [**Group 1**] [**Group 2**] stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- D. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.

- C. Epoxy Zinc-Rich Primer: Compatible with topcoat.
- D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.
- G. Shrinkage-Resistant Grout: Factory-packaged, non-metallic, non-staining, non-corrosive, non-gaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- H. Concrete: Comply with requirements in *Section 033000 – Cast-in-Place Concrete* for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing **[and contour of welded surface matches that of adjacent surface]**.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

- H. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than 8 inches from ends and corners of units and 24 inches o.c.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
- B. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.
 - 1. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches o.c.
- C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.

2.7 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.
 - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize [**and prime**] shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with zinc-rich primer.
- E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.8 METAL LADDERS

- A. General:
 - 1. Comply with ANSI A14.3.
- B. Steel Ladders:
 - 1. Space siderails [**16 inches**] [**18 inches**] apart unless otherwise indicated.

2. Siderails: Continuous, [**3/8-by-2-1/2-inch**] [**1/2-by-2-1/2-inch**] steel flat bars, with eased edges.
3. Rungs: [**3/4-inch-diameter**] [**3/4-inch-square**] [**1-inch-diameter**] [**1-inch-square**], steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide non-slip surfaces on top of each rung.
6. Galvanize [**and prime**] [**exterior**] ladders, including brackets.
7. Prime [**exterior**] ladders, including brackets and fasteners, with zinc-rich primer.

C. Aluminum Ladders:

1. Space siderails [**16 inches**] [**18 inches**] apart unless otherwise indicated.
2. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
3. Rungs: Extruded-aluminum tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed tread surfaces.

2.9 LADDER SAFETY CAGES

- A. Fabricate ladder safety cages to comply with ANSI A14.3. Assemble by welding or with stainless steel fasteners.
- B. Provide primary hoops at tops and bottoms of cages and spaced not more than 20 feet o.c. Provide secondary intermediate hoops spaced not more than 48 inches o.c. between primary hoops.
- C. Galvanize ladder safety cages, including brackets and fasteners.
 1. Prime ladder safety cages, including brackets and fasteners, with zinc-rich primer.

2.10 STRUCTURAL-STEEL DOOR FRAMES

- A. Fabricate structural-steel door frames from steel shapes, plates, and bars of size and to dimensions indicated, fully welded together, with 5/8-by-1-1/2-inch steel channel stops, unless otherwise indicated. Plug-weld built-up members and continuously weld exposed joints. Reinforce frames and drill and tap as necessary to accept finish hardware.
 1. Provide with integrally welded steel strap anchors for securing door frames into adjoining concrete or masonry.
- B. Galvanize [**exterior**] steel frames.
- C. Prime [**exterior**] steel frames with zinc-rich primer.

2.11 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize [**exterior**] miscellaneous steel trim.
- D. Prime [**exterior**] miscellaneous steel trim with zinc-rich primer.

2.12 METAL BOLLARDS

- A. Fabricate metal bollards from [**Schedule 80 steel pipe**] [**Schedule 40 steel pipe**] [**1/4-inch wall-thickness rectangular steel tubing**] [**steel shapes, as indicated**].
 - 1. Cap bollards with 1/4-inch-thick steel.
- B. Fabricate bollards with 3/8-inch-thick, [**steel**] [**stainless steel, ASTM A480, No. 4 finish**] baseplates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch anchor bolts.
- C. Fabricate sleeves for bollard anchorage from steel or stainless steel [**pipe**] [**or**] [**tubing**] with 1/4-inch-thick, steel or stainless steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than OD of bollard.
- D. Prime steel bollards with zinc-rich primer.

2.13 [**PIPE**] [**DOWNSPOUT**] GUARDS

- A. Fabricate [**pipe**] [**downspout**] guards from 3/8-inch-thick by 12-inch-wide, steel plate, bent to fit flat against the wall or column at both ends and to fit around pipe with 2-inch clearance between pipe and pipe guard. Drill each end for two 3/4-inch anchor bolts.
- B. Galvanize [**and prime**] steel [**pipe**] [**downspout**] guards.
- C. Prime steel [**pipe**] [**downspout**] guards with zinc-rich primer.

2.14 ABRASIVE METAL [**NOSINGS**] [**TREADS**] [**AND**] [**THRESHOLDS**]

- A. Cast-Metal Units: Cast [**iron**] [**aluminum**], with an integral-abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both. Fabricate units in lengths necessary to accurately fit openings or conditions.
- B. Extruded Units: Aluminum, with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions.
 - 1. Provide ribbed units, with abrasive filler strips projecting 1/16 inch above aluminum extrusion.
 - 2. Provide solid-abrasive-type units without ribs.

- C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- D. Drill for mechanical anchors and countersink. Locate holes not more than 4 inches from ends and not more than 12 inches o.c., evenly spaced between ends, unless otherwise indicated. Provide closer spacing if recommended by manufacturer.
- E. Apply bituminous paint to concealed surfaces of cast-metal units.
- F. Apply clear lacquer to concealed surfaces of extruded units.

2.15 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize bearing and leveling plates.
- C. Prime plates with zinc-rich primer.

2.16 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Galvanize [**and prime**] loose steel lintels located in exterior walls.
- C. Prime loose steel lintels located in exterior walls with zinc-rich primer.

2.17 BREECHING FRAMES AND THIMBLES

- A. Furnish for building into chimney structure, breaching frames and thimbles consisting of 2" x 2" x 1/4" angle frame with suitable anchors for building into masonry, to which shall be securely welded or riveted a No.10 gauge sheet iron collar projecting not less than 6" from face of chimney for attachment of boiler breeching. Frames shall be approximately of sizes indicated on drawings, except dimensions shall be obtained from the Heating and Ventilation Contractor. Furnish angles, lintels and accessories required to complete the installation.
- B. Entire assemble shall be gas tight.
- C. Breeching frames and thimbles shall be furnished by this section for installation by *Section 040120.63 Brick and Terra Cotta Masonry Repair*.

2.18 FIRE PASSAGE GATES

- A. Provide wrought iron picket gate, 6 feet high by width to suit width of fire passage.

- B. Gate shall be provided with an enclosed vandal-proof housing, Panic Bar, mortise lock, butts and guard plate.
- C. All members of gates shall be provided with shop coat of rust inhibitive paint.

2.19 FIRE ESCAPES

- A. Repair defective parts of fire escapes with materials equivalent to original part.
- B. Provide and install a gooseneck ladder to roof if required by Code.
- C. Drop ladders:
 - 1. Provide new drop ladders where indicated on Drawings.
 - 2. Unless otherwise detailed, drop ladders shall be 20" wide with flat stringers 1-1/2" x 3/8" with 5/8" diameter rungs spaced not more than 12" on centers headed into stringers with ends upset. Drop ladders shall be supported in accordance with N.Y.C. 1968 Building Code and M.D.L. Article 3, Section 53. And Rule 4.0.
 - 3. Guides shall consist of 1-1/2" x 1-1/2" x 1/4" angles constructed in accordance with N.Y.C. 1968 Building Code, M.D.L. Article 3, Section 53; and Rule 4.0.

2.20 SECURITY GATES

- A. Interior swing-type security gates shall have a Certificate Approval Number issued by the New York City Fire Department.
- B. The security gate shall consist of a fixed angle frame with a swinging grate hinged within a formed angle sub-frame. The fixed frame has a bent mounting angle on both sides. The top and bottom of the frame have spaces based on design. The frame is attached to the window return jambs. A steel plate and protective ring is mounted around the locking mechanism. The grate is mounted on one side to the frame, using hinges.

2.21 ENTRANCE COURT GATE AND FENCE

- A. Provide gate and fence complete with all fittings, fastenings, erection accessories and hardware and as shown on the drawings.
 - 1. Posts shall be 2-1/2" square, tubular, 14 gauge steel, galvanized. Posts shall be pierced to accept stringers of the grille.
 - 2. Stringers shall be 1-9/16" extruded or formed wrought iron channels. Stringers shall be pierced to receive and allow pickets to pass through. Pickets shall be welded to stringers. All welding shall be ground smooth.
 - 3. Pickets shall be 3/4" square, solid wrought iron and spaced evenly and pass through pierced holes in stringers and welded to stringers.
 - 4. Provide gate consistent in materials and design with adjacent fence. Gate shall be provided with mortise latch.
 - 5. All components shall be shop primed with rust inhibitive paint.

2.22 SECURITY BARS [GRILLES] AT OPENINGS

- A. Burglar bar grilles shall be of size to fit masonry opening. Grilles shall be fabricated to provide for enclosure of air conditioning unit projection where air conditioners are provided.
- B. Grilles shall be prime painted at factory and finish painted in field.

2.23 CHILD WINDOW GUARDS

- A. Manufacturers: Those listed on the most recent edition of the *Window Guard and Policy Acceptance Board Approved Manufacturers List*, promulgated by the New York City Department of Health and Mental Hygiene.

Note: To simplify the installation of child window guards, it is recommended that 5-bar, full-height guards be selected for double-hung windows, instead of 3-bar minimum height guards.

- B. Coating of guards shall be unleaded. A statement from guard manufacturer is required.

2.24 PUBLIC HALL WINDOW GUARDS

- A. Manufacturers: Those listed on the most recent edition of the *Window Guard and Policy Acceptance Board Approved Manufacturers List*.
- B. Coating of guards shall be unleaded. A statement from guard manufacturer is required.

2.25 AREAWAY GRATINGS

- A. Frames: Areaway grating frames shall be furnished and delivered by this section for building in under another section. Frames shall consist of 1 1/2 inch by 1 1/2 inch by 1/4 inch continuous steel angle. Anchor shall be welded to back of angle frame and spaced not over two feet on centers.
- B. Grating: For spans up to and including four feet, the bearing bars shall be 1 1/4 inches by 3/16 inch spaced 1 3/16 inches on center. Unless otherwise specified, gratings shall be steel rectangular mesh, optional pressure locked or welded.

2.26 PIT FRAMES AND COVERS

- A. Furnish and install pit frames and covers where indicated on the drawings.
- B. Frames shall consist of steel angles, having a minimum size of 2" x 2" x 1/4", welded together on steel strap anchors.
- C. Covers shall be 1/4" thick-checked plate to fit frames, and finish flush with adjacent floor surface, complete with flush lifting rings.

2.27 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.

2.28 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153 for steel and iron hardware and with ASTM A123 for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items [**not indicated to be galvanized**] unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with zinc-rich primer.
- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, Power Tool Cleaning.
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel, for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for [**ceiling hung toilet partitions**] [**operable partitions**] [**overhead doors**] [**and**] [**overhead grilles**] securely to, and rigidly brace from, building structure.
- C. Anchor shelf angles securely to existing construction with [**expansion anchors**] [**anchor bolts**] [**through bolts**].
- D. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

3.3 INSTALLATION OF METAL BOLLARDS

- A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.
- B. Anchor bollards to existing construction with [**expansion anchors**] [**anchor bolts**] [**through bolts**]. Provide four 3/4-inch bolts at each bollard unless otherwise indicated.
 - 1. Embed anchor bolts at least 4 inches in concrete.
- C. Anchor bollards in concrete [**with pipe sleeves preset and anchored into concrete**] [**in formed or core-drilled holes not less than 42 inches deep and 3/4 inch larger than OD of bollard**]. Fill annular space around bollard solidly with shrinkage-resistant grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward bollard.
- D. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- E. Fill bollards solidly with concrete, mounding top surface to shed water.

3.4 INSTALLATION OF BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 INSTALLING FIRE ESCAPE

- A. Anchorage: fire escapes and platforms shall be securely anchored with through wall steel straps and steel plates and in accordance with N.Y.C. 1968 Building Code and M.D.L. Article 3, Section 53. And Rule 4.0.
- B. No field welding is permitted in the repair of fire escapes. All repairs must be bolted or shop welded.

3.6 INSTALLING SECURITY GATES

- A. All installations and uses of fire escape window gates shall comply with the applicable New York City Building Code, Fire Prevention Code, and the New York State Multiple Dwelling Law.
 - 1. Window gates shall be attached to window return jambs only with standard wood or sheet metal screws. No other fastening devices shall be used.
 - 2. Fire escape window gates shall be installed so that there is a ¼” continuous space with a depth of at least ¾” between the gate and window frame for the entire height of the gate. The depth of the actual screw anchorage shall be no more than one inch.
 - 3. Gates shall be installed so as to be readily openable from inside the dwelling without the use of a tool, key, or special knowledge or effort and with no more than one releasing operation.
 - 4. Gates shall be installed so that they will not reduce the required dimensions of the window opening. In no case shall the opening be less than 24 inches wide and 30 inches high. The bottom of the window gate opening shall not be higher than the windowsill height and in no case higher than 36 inches.
- B. The window gate shall be permanently tagged, labeled or inscribed with the name, address, telephone number of Manufacturer, the Certificate of Approval number and the statement informing the user that Manufacturer will rectify any manufacturing defects in the gate upon notification.
- C. A permanent label shall be affixed on visible facing flat surface. Said label (written in English and Spanish), shall read: WARNING! OBSTRUCTION OF FIRE ESCAPE GATE SWING OPERATION BY ANY TYPE OF FURNITURE, WINDOW COVERING, PLANTS, ETC., IS DANGEROUS AND ILLEGAL

3.7 INSTALLING ENTRANCE COURT GATE AND FENCE

- A. Posts and pickets shall be installed truly, vertical and all rails parallel to finished grade. Posts shall be set in footings or sleeves.

3.8 INSTALLING CHILD WINDOW GUARDS FOR DOUBLE-HUNG WINDOWS

- A. Each guard sold by a manufacturer shall be sold with a self-contained envelope or plastic bag containing:
 - (1) Approved installation instructions.

- (2) “L-shaped” or other approved stops (or limiting devices), and
 - (3) Specified screws for installation of guard and stops/limiters. If wood screws are supplied by the manufacturer, a warning label should be included stating that for metal installations, appropriate type, size, and length screws must be substituted. This warning shall be imprinted on the packaging container.
- B. Screws used to mount window guards and stopping devices shall be one-way sheet metal screws or metal tamper-resistant screws. Tamper-resistant screws are defined as screws requiring special tools for their installation and/or removal, which tools are not readily available in retail hardware stores. All tamper-resistant screws must be counter-sunk flush with the stile or stopping device. Appropriate screws shall be:
- (1) Minimum size #10 and long enough to penetrate one inch deep into a wooden window frame, or
 - (2) Of an adequate type, size and length to be securely fastened to a metal window frame. Manufacturer shall supply all required screws with guards.
- C. Instructions shall specify maximum window width for which the guard is intended, and shall contain the following prominently-printed wording: WARNING: USE OF THIS GUARD BEYOND SPECIFIED MAXIMUM WIDTH IS DANGEROUS AND ILLEGAL.
- D. Instructions shall prominently specify: WINDOW GUARDS MAY NOT BE INSTALLED IN WINDOWS PROVIDING ACCESS TO FIRE ESCAPES.
- E. Instructions shall specify that guards be installed so that bottom horizontal members are mounted a maximum of 4-1/2 inches above windowsill.
- F. Instructions shall specify the use of the supplied “L-shaped” stops to be installed with screws provided, or alternative approved stopping devices also provided with prescribed screws, to limit the opening above the lowest section of the top horizontal bar to 4-1/2 inches when the bottom sash is raised.
- 3.9 INSTALLING CHILD WINDOW GUARDS FOR *OTHER-THAN* DOUBLE-HUNG WINDOWS
- A. Refer to Rules of the City of New York, Title 24 Department of Health and Mental Hygiene, Chapter 12 Window Guards §12-11 Specifications for Window Guards for Other Than Double Hung Windows.
- 3.10 INSTALLING PUBLIC HALL WINDOW GUARDS
- A. Follow manufacturer’s installation instructions.
- 3.11 INSTALLING AREAWAY GRATINGS
- A. Anchorage: Gratings shall be secured to angle frames with one (1) inch by one (1) inch by 1/4 inch flat clip welded to gratings and top screwed to frames using tamperproof machine bolts.

3.12 INSTALLING PIT FRAMES AND COVERS

- A. Frames shall be installed at required locations, in cooperation with other trades. Covers shall be secured to frames using a minimum of four (4) flush, screw type, approved fasteners.

3.13 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

END OF SECTION 055000