

1 GENERAL

A. GENERAL REQUIREMENTS

Conform to the provisions of Part I and DIVISION 1.

B. JOB CONDITIONS AND REQUIREMENTS

1. Visit the site and become familiar with existing site conditions that affect the Work of the Section. Keep dust build-up to a minimum. Keep streets and driveways clean and free of debris and open for traffic.
2. Work of this section must not interfere with the Owner's normal business routine and hours. The Construction Schedule may require after business hours or week-end work. Coordinate schedule with Building Manager and Owner's Project Representative.

C. PROTECTION

1. Temporary Partition:  
If required for protection of Owner's property and customers, provide temporary partitions around areas of demolition work. Provide protection as required to keep dust and moisture confined to the immediate work area.
2. Coordination:  
Coordinate protection procedures with Owner's Project Representative.
3. Utilities:  
Protect and mark any utilities encountered; notify proper authorities and make dispositions as directed, at no additional cost to Owner. Keep existing utilities in continuous operation.

D. OBJECTIONABLE NOISES

Work requiring use of air hammers and other noisy equipment shall be coordinated with Owner's Project Representative at all times. The construction schedule may require after business hours or week-end work.

E. SUBMITTAL

At the conclusion of the project, the Contractor shall be responsible for submitting along with the closeout documents the Frontier Communications Calculated Plant Displaced Form and the Equipment Master Work Sheet. Complete the Description, Quantity, and Unit columns for each item removed from the building or site as part of this project. Mechanical and Electrical shall submit their respective portions of the work on separate forms. Refer to attached copies of this form.

2 PRODUCTS

Not applicable.

3 EXECUTION

A. EXISTING SITEWORK:

1. At the designated site locations remove and legally dispose of the existing concrete pavement, curbs, ramps and asphalt paving materials as shown on the Architectural Drawings. Refer to Architectural Drawings for locations and details for scheduling.

**B. CUTTING**

All cutting of concrete or masonry shall be performed with carbide-tipped power driven tools. All cuts shall be square and true. No cover-cutting allowed, hand chip to square up corners of openings. Repair over-cuts as directed, and at no increase to contract costs. Core drill circular openings. Use carbide tip drills for smaller holes. Jack and rotary type hammers over 3/8" drive not permitted. Refer to Architectural drawings for locations and details for new work.

**C. EXISTING ABANDONED MECHANICAL AND ELECTRICAL ITEMS**

Remove existing abandoned mechanical and electrical items as noted on the drawings.

**D. OTHER TRADES**

Coordinate demolition of electrical and mechanical items with electrical and mechanical sub-contractors. Avoid damage to personnel and public from contact with any existing electrical conduit or wiring.

**E. SALVAGE**

All items removed, unless requested by the Owner or noted to remain the property of the Owner, shall become property of the Contractor and shall be removed from the site at Contractor's expense.

**F. PATCHING AND REPAIR**

Patch and repair to match adjacent finishes where existing work is removed and where new work occurs. Extent includes floors, walls, and ceilings for all work in this contract including mechanical and electrical. Make neat repairs with terminal edges parallel to the building major axis. Use materials of matching texture and finish. Seal around ducts and pipes which project through floor slabs and walls, refer to Section 07900.

**G. CLEAN-UP**

Remove all debris from site after each day's work. Do not allow to accumulate on site. Haul away from site and dispose of at Contractor's expense.

END OF SECTION

1 GENERAL

A. GENERAL REQUIREMENTS

Conform to the provisions of Part I and DIVISION 1.

B. WORK IN OTHER SECTIONS

Steel reinforcement, covered under Section 03200.

Cast-in-place concrete, covered under Section 03300.

Caulking of expansion joints, covered under Section 07900.

Hangers, sleeves and inserts for mechanical and electrical work, covered under Divisions 15 and 16.

C. CHANGE ORDER OVERHEAD AND PROFIT

If change orders result in additional cost to subcontractor, the actual cost plus fifteen percent (15%) overhead and profit shall be added to the Contract Sum. If changes result in decreased cost to subcontractor, the actual savings shall be deducted from the Contract Sum.

D. BUILDING CODE

All concrete work shall conform to the requirements of the International Building Code and "Specifications for Structural Concrete for Building," (ACI 301-72). Where conflict occurs with other provisions of this specification, the more stringent shall govern.

E. SCHEDULING

Contractor shall provide and erect sufficient forms so that the work of pouring concrete will proceed at a rate to insure maintaining a schedule so that the time of the inspector shall be as continuous as practicable.

F. MSDS Submittals:

After award of Contract, and before any materials are delivered to the site, Material Safety Data Sheets (MSDS) shall be submitted on all materials/products that contain or use chemical solution for treatment or as additives and/or display Hazardous/Warning/Caution information in their products literature or on their labels.

2 PRODUCTS

A. EARTH FORMS

Not permitted for use as side forms, unless specifically indicated or specified.

B. FORM MATERIALS

1. Plywood:

New "Plyform" grade Douglas fir veneer; conform to Product Standard PS-1-74. Edge sealed and factory treated with form oil. May be face sealed in lieu of form oil at Contractor's option. 3/4-inch thickness if used as sheathing with 12-inch stud spacing or 1/4-inch thickness if used as lining with shiplap sheathing.

2. Lumber for Forms:

Standard grade, or better, Douglas fir or as approved in advance by the Architect. Use surfaced lumber unless specified otherwise.

3. Form Ties:

Removable form bolts with coil ties, or snap ties. Either system shall have cone spreaders and tie metal shall be 3/4-inch minimum back of concrete face. Approved manufacturers are Superior Concrete Accessories, Burke and Richmond. No wood spreaders allowed.

3 EXECUTION

A. CONSTRUCTION

1. General:

Conform to shapes and dimensions shown. Construct accurately; brace to be unyielding. Make reasonably tight to prevent excess leakage. Set form board for footings and plywood for walls horizontally. Provide openings required for other trades, including mechanical and electrical. Remove all debris and clean out all forms before pouring any concrete. Keep forms moist prior to pour to prevent shrinkage and warping.

2. Maximum Spacing:

Studs and joists not farther apart than 16-inches o.c. Space wall form ties not over 2 feet apart horizontally and 2 feet apart vertically.

3. Chamfering:

Chamfer edges in exposed concrete as detailed on the drawings Chamfer size 1/2" x 1/2" except as otherwise detailed.

4. Plywood Forms:

All forms for exposed concrete shall be new plywood wood forms as specified in Paragraph 2B(1).

Make joints flush, in regular pattern, as inconspicuous as possible. Use full-size sheets insofar as possible in exposed work.

5. Lumber Forms:

May be used for other unexposed concrete at Contractor's option.

6. Re-use of Plywood Forms:

Plywood forms may be reused for unexposed concrete work provided all damaged edges are removed, all imperfections in faces are repaired and all holes filled and plywood is cleaned to obtain concrete surface equal to that obtained by new plywood.

B. TREATMENT OF FORMS

1. Sealing of Lumber and Plywood Forms: Before usage, faces and edges shall be coated with Coating and Adhesives Corp. "White Roc FR-20"; Nox Crete "Pre-Form"; or as approved in advance by the Architect. Apply in accordance with manufacturer's directions.

C. RETIGHTENING FORMS

Required for all exposed construction joints. Install row of adjustable spreaders approximately 2 inches above joints. Retighten just before making the succeeding pour.

D. MISCELLANEOUS EMBEDDED ITEMS

1. Anchor Bolts:

Set as required on the drawings.

2. Inserts, Sleeves, Reglets, Conduit and Similar:

Allow all trades and contractors time and facilities to install. Conform to Section 503 of ACI Building Code and the Uniform Building Code. General Contractor shall furnish and install all sleeves and frames for all openings shown on drawings or required for equipment, except those sleeves specified under the Mechanical and Electrical work.

3. All Other Miscellaneous Items:

Build-in items specified in other Sections exactly where shown. Verify locations which may be critical.

E. JOINTS AND STOPPAGES

1. Construction Joints:

In accordance with International Building Code, except as modified herein. Provide nominal 3/4" x 2-1/2" key at all construction joints, unless otherwise shown on drawings. Unless shown otherwise on the drawings, submit proposed locations of construction and contraction joints to Architect for approval.

2. Expansion Joints:

a. Materials:

1. Expansion joint shall be preformed non-extruding fiber board thoroughly impregnated with a asphaltic compound; a minimum of 35% by weight of bitumen. 1/2-inch thick unless shown other wise; ASTM D-1751- 65. Provide with removable joint cap for sealing compound.
2. Removable joint cap of extruded high impact polystyrene as manufactured by Contie or approved equal by Architect. Caution: Where polyurethane sealant primers are used a bondbreaker tape should be applied prior to caulking.
3. Sealing compound shall be self-leveling traffic grade two-part polyurethane sealant; Chem-Calk 550 as manufactured by Woodmont Products, Inc. or as approved equal by Architect. Conform to manufacturer's written instructions for priming, installation, etc. Color as selected by Architect.

b. Joints where finish is concrete:

Provide in walks, paved areas, curbs not over 30 feet apart and at walls, columns and elsewhere as indicated. Joints shall be continuous and full depth and width of concrete. Stop filler 1/2-inch below top of concrete; allow for sealant as specified above. Tool edges of all exposed joints.

3. Control Joints:

Provide Burke Kold Joint where indicated and detailed on drawings; cut slab reinforcing.

F. REMOVING FORMS AND SHORING

1. Ties:

Remove 4 days after pour. Fill holes with dry pack cement mortar.

2. Forms:

Remove only after concrete has sufficiently hardened to prevent damage. Vertical forms may be removed 24 hours after pour where structure is supported on shores.

END OF SECTION

1 GENERAL

A. GENERAL REQUIREMENTS

Conform to the provisions of Part I and DIVISION 1.

B. STANDARD SPECIFICATIONS

ACI Standard 301-72 "Specifications for Structural Concrete for Buildings, Chapter 5," hereinafter referred to as "ACI 301", and ACI 318-71 "Standard Building Code Requirements for Reinforced Concrete", hereinafter called "ACI 318".

C. CHANGE ORDER OVERHEAD AND PROFIT

If change orders result in additional cost to subcontractor, the actual cost plus fifteen percent (15%) overhead and profit shall be added to the Contract Sum. If changes result in decreased cost to subcontractor, the actual savings shall be deducted from the Contract Sum.

D. CODE

International Building Code, latest edition.

E. SHOP DRAWINGS

After award of Contract, and before any materials are delivered to the site, submit to Architect shop drawings for reinforcing steel bending and placing diagrams prepared by or under the supervision of a qualified steel detailer, making the submittal in accordance with the provisions of Section 01340 of these specifications.

F. NOTIFICATIONS

Notify Architect and testing agency 48 hours prior to any work covered under this section for scheduling field inspections.

2 PRODUCTS

A. REINFORCING STEEL

1. Reinforcing Bars:

All steel shall conform to ASTM A615, Grade 60. Unpainted, uncoated, free from rust, dirt and loose scale.

2. Temperature Steel, Stirrups, Dowels:

All steel shall conform to ASTM A615, Grade 60. Unpainted, uncoated, free from rust, dirt and loose scale.

3. Steel Fabric:

Welded steel wire fabric, ASTM A185.

As noted on drawing.

B. ACCESSORIES

1. Tie Wire:

16 gauge or heavier, black annealed wire.

2. Spacer Bars for Wall Reinforcing:

#3 bars, "U" shape. Stock items of equivalent function may be submitted for approval.

C. BENDING AND CLEANING

Conform to International Building Code, Section 1907.

3 EXECUTION

A. PLACING

Conform to International Building Code, Section 1907.5.1 through 1907.5.4. Place accurately in accordance with shop drawings. Tie intersections in accordance with best practices and as necessary to prevent displacement. Install spacer bars in walls at 3-foot centers both ways where appropriate. Prevent water from softening soil at footings during steel placing.

B. SPLICES

Conform to International Building Code.

C. PROTECTIVE COVERING OF CONCRETE

Conform to International Building Code, Section 1907.7.1 through 1907.7.7 and structural notes on Drawings.

D. WELDING

By welders having certificate of qualification from American Welding Society. Conform to requirements of Standard Code of Arc and gas Welding in Building Construction issued by the American Welding Society.

E. SUPPORTS FOR REINFORCEMENT

Concrete blocks or metal chairs.

F. STEEL FABRIC

Provide in all concrete walks and exterior slabs on grade unless noted otherwise. Provide in all floor slabs where bars are not indicated. Provide elsewhere where indicated on drawings. Conform to details where indicated. Elsewhere block up so as to obtain complete embedment in top of slab. Overlap at splices not less than 1-1/2 times the mesh size. Do not carry through expansion joints.

G. INSPECTION

Job superintendent shall personally inspect placement of all reinforcing steel to insure proper installation, in accordance with design drawings. He shall note in his Daily Progress Report his approval prior to pouring of concrete. Notify testing agency per paragraph 1F, page 03200-1.

END OF SECTION

1 GENERAL

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B. WORK IN OTHER SECTIONS

Steel reinforcement, covered under Section 03200.

Hangers, sleeves and inserts for mechanical and electrical work, covered under Divisions 15 and 16.

C. CHANGE ORDER OVERHEAD AND PROFIT

If change orders result in additional cost to subcontractor, the actual cost plus fifteen percent (15%) overhead and profit shall be added to the Contract Sum. If changes result in decreased cost to subcontractor, the actual savings shall be deducted from the Contract Sum.

D. BUILDING CODE

All concrete work shall conform to the requirements of the International Building Code. Where a conflict occurs with other provisions of the specifications, the more stringent shall govern.

E. SUBMITTALS

1. Product Data:

Before any materials are delivered to the site, submit a written statement giving the design mix and properties by weight of cement and aggregate plus amount of water in gallons per bag proposed for use in each class or type of concrete, and minimum compressing strength in PSI as herein specified.

2. MSDS Submittals:

Before any materials are delivered to the site, Material Safety Data Sheets (MSDS) shall be submitted on all materials/products that contain or use chemical solution for treatment or as additives and/or display Hazardous/Warning/Caution information in their products literature or on their labels.

F. DEFECTIVE WORK

Contractor shall remove and replace at his own expense.

G. NOTIFICATIONS

Notify Testing Laboratory and Architect 48 hours prior to any testing requirements during construction for scheduling test.

2 PRODUCTS

A. MATERIALS

1. Portland Cement:

ASTM C150, Type I and Type III, Portland Cement. Use same brand of cement for all exposed work.

2. Regular Aggregates:

Conform to requirements of Paragraph 306 of the ACI Building Code.

3. Bonding Agent:

Bonding "Weld-crete" as manufactured by Larsen Products Corp., or "Daraweld-C" as manufactured by Dewey and Almy.

4. Densifying Admixture:

Master Builders "Pozzolith" per manufacturer's recommendations to all concrete except footings.

5. Air-Entraining Agent:

Concrete for exterior walks to be air-entrained (5% air). Conform to ASTM C260.

6. Concrete Hardener:

"Ashford Formula" as manufactured by Curecrete Chemical Co. Inc.



**B. CONCRETE MIXING**

1. General:

Ready-mixed concrete per ASTM C94. Contractor responsible for quality of concrete.

2. Proportioning and Mixing:

Conform to International Building Code.

3. Water content:

As little as practicable for the specific conditions. Maximum 3-inch slump for all concrete slabs, 4 inches elsewhere.

4. Admixtures:

Admixtures other than air-entraining agents and densifying admixtures as specified shall not be used except as approved by Architect.

5. Air-Entrained Concrete:

All exterior concrete paving and steps resting on earth shall be air-entrained to contain 5% of entrained air.

6. Densifying Admixture:

Use in concrete for interior slabs. Use in all other concrete except air-entrained concrete at the Contractor's option. Use 2 fluid ounces per sack of cement in accordance with manufacturer's instructions.

€Add at mixing plant; reduce water content to provide specified slump.

**C. STRENGTH OF CONCRETE**

Minimum compressive strength in psi when tested in accordance with ASTM C39-72 after 28 days shall be 2,000 psi minimum or as noted in the Structural Notes on the Drawings.

3 EXECUTION

**A. MEMBRANE UNDER SLABS ON GROUND**

1. Extent:

Under all interior concrete slabs.

2. Material:

Minimum acceptable clear 10 mil polyethylene vapor barrier.

3. Installation:

Cover entire area under slabs specified above. Overlap all joints not less than 2 feet minimum. Provide tight seal at all utilities. Protect during placement of sand base and gravel, refer to architectural drawings for details. Take all reasonable precautions to prevent puncturing. Puncturing for screed supports is permitted. Repair all other punctures and all torn places.

**B. CONVEYING AND PLACING CONCRETE**

1. General:

In accordance with the International Building Code. Pour monolithically insofar as practicable. Adjust mix only on approval of Architect. Deposit concrete as close to final positions as practicable. Vibrate as necessary to obtain thorough compaction, embedment of reinforcing and complete filling of forms. Segregation of materials to be prevented. Protect soil-bearing surfaces from softening during placing operations.

2. Protection:

a. General:

Protect all concrete from freezing per Section 01202, ACI Building Code. Protect all fresh concrete from direct rays of sun or drying effect of wind. Protect all concrete floor against rain spatter; pitted floors will be accepted.

b. Floor Slabs:

## SECTION 03300, CAST-IN-PLACE CONCRETE

After concrete floors have been cured and before any traffic or work is allowed over floors, protect floors with reinforced kraft paper; maintain in good condition until all painting is completed or floor covering installed.

### C. SLAB FINISHES

#### 1. General:

Screed to true levels or slopes. Finish monolithically with topping. Tool all salient edges of concrete. Machine troweling will be permitted provided that maximum specified tolerance is not exceeded. Do not absorb water with neat cement. Make sharp arris at all wall to floor conditions.

#### 2. Slab Tolerance:

Tolerance 1/8 inch in 10 feet based on mean floor elevation. Tolerance not cumulative. Control by 10-foot straight edge. Floors with tolerance in excess shall be ground or underplayed as specified hereinafter. Two-pass steel troweling to hard, dense surface, free from marks.

#### 3. Slab Finishes:

##### a. Trowel Finish:

Provide trowel finish all locations except where broom finish is specified.

##### b. Broom Finish:

Provide Broom finish on exterior walks and slabs. Lightly broom with soft bristled broom after one-pass steel troweling.

#### 4. Defective Work:

All slabs not within the tolerance specified in Paragraph "Slab Tolerances" above shall be corrected with underlayment if area is to receive floor covering. If not, replace slabs.

### D. EXPOSED FORMED SURFACES

All exposed concrete not otherwise specified shall be treated as follows:

#### 1. Fins:

Remove from all exposed work by Carborundum stone or power grinder.

#### 2. Voids, Gravel Pockets and Similar:

Cut out defective areas 1-inch deep; vertical edges. Wet cavities and adjacent area. Cement mortar to match adjacent areas, use as little water as possible. Retemper 2 hours for shrinkage. Thoroughly fill voids and finish off; match adjacent surface in exposed work.

END OF SECTION

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
  - 2. Loose bearing and leveling plates.
  - 3. Steel weld plates and angles for casting into concrete not specified in other Sections.
  - 4. Pipe guards.
  - 5. Metal downspout boots.
- B. Products furnished, but not installed, under this Section include the following:
  - 1. Loose steel lintels.
  - 2. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
- C. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, wedge-type inserts and other items indicated to be cast into concrete.
  - 2. Division 4 Section "Unit Masonry Assemblies" for installing loose lintels, anchor bolts, and other items indicated to be built into unit masonry.
  - 3. Division 5 Section "Structural Steel."
  - 4. Division 5 Section "Gratings."

1.3 SUBMITTALS

- A. Product Data: For the following:
  - 1. Paint products.
  - 2. Grout.
- B. Shop Drawings: Show fabrication and installation details for metal fabrications.
  - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

2. Provide templates for anchors and bolts specified for installation under other Sections.
  3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Mill Certificates: Signed by manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.
- D. Welding certificates.
- E. Qualification Data: For professional engineer.
- 1.4 QUALITY ASSURANCE
- A. Welding: Qualify procedures and personnel according to the following:
1. AWS D1.1, "Structural Welding Code--Steel."
  2. AWS D1.2, "Structural Welding Code--Aluminum."
  3. AWS D1.3, "Structural Welding Code--Sheet Steel."
  4. AWS D1.6, "Structural Welding Code--Stainless Steel."
- 1.5 PROJECT CONDITIONS
- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
  2. Provide allowance for trimming and fitting at site.
- 1.6 COORDINATION
- A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.
  - 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
  - 4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 METALS, GENERAL

- 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. GALVANIZING  
All exterior steel work shall be galvanized. Other steel work shall be galvanized where noted on drawings

2.3 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.
- C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- D. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- E. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
- F. Slotted Channel Framing: Cold-formed metal channels with continuous slot complying with MFMA-3.
  - 1. Size of Channels: 1-5/8 by 1-5/8 inches

2. Material: Galvanized steel complying with ASTM A 653/A 653M, commercial steel, Type B or structural steel, Grade 33, with G90 coating; 0.108-inch nominal thickness.

#### 2.4 NONFERROUS METALS

- A. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- B. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
- C. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- D. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.
- E. Bronze Plate, Sheet, Strip, and Bars: ASTM B 36/B 36M, Alloy UNS No. C28000 (muntz metal, 60 percent copper).
- F. Bronze Extrusions: ASTM B 455, Alloy UNS No. C38500 (extruded architectural bronze).
- G. Bronze Castings: ASTM B 584, Alloy UNS No. C83600 (leaded red brass) or No. C84400 (leaded semired brass).
- H. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500.
- I. Nickel Silver Castings: ASTM B 584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

#### 2.5 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts and, where indicated, flat washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group [1] [2].
- D. Anchor Bolts: ASTM F 1554, Grade 36.
  1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

- E. Eyebolts: ASTM A 489.
- F. Machine Screws: ASME B18.6.3
- G. Lag Bolts: ASME B18.2.1.
- H. Wood Screws: Flat head, ASME B18.6.1.
- I. Plain Washers: Round, ASME B18.22.1.
- J. Lock Washers: Helical, spring type, ASME B18.21.
- K. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
  - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
- L. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
  - 1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
  - 2. Material for Anchors in Exterior Locations: Alloy Group 1 stainless-steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

## 2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Shop Primers: Provide primers that comply with Division 9 painting Sections.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.

## 2.7 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 true to line and level 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 where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
  - 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.



2.8 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. 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 retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
  - 1. Fabricate units from slotted channel framing where indicated.
  - 2. Furnish inserts if units are installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.9 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. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches, unless otherwise indicated.
- C. Galvanize loose steel lintels located in exterior walls.

2.10 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 plates after fabrication.

2.11 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with not less than two integrally welded steel strap anchors for embedding in concrete.

## 2.12 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, where indicated.

## 2.13 PIPE GUARDS

- A. Fabricate pipe 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 pipe guards after fabrication.

## 2.14 METAL DOWNSPOUT BOOTS

- A. Provide downspout boots made from **cast aluminum** in heights indicated with inlets of size and shape to suit downspouts.
  - 1. Refer to Civil Drawings.

## 2.15 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

## 2.16 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
  - 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
  - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
  - 1. Exteriors: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 2. Interiors: SSPC-SP 3, "Power Tool Cleaning."
- C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

#### 2.17 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Dull Satin Finish: No. 6.
- C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

#### 2.18 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. As-Fabricated Finish: AA-M10.

### 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 bolts, 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.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

### 3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: 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 operable partitions securely to and rigidly brace from building structure.
- C. 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.
1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

### 3.3 INSTALLING 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 grout.

1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

#### 3.4 INSTALLING PIPE GUARDS

- A. Provide pipe guards at exposed vertical pipes in parking garage where not protected by curbs or other barriers. Install by bolting to wall or column with expansion anchors. Provide four 3/4-inch bolts at each pipe guard. Mount pipe guards with top edge 26 inches above driving surface.

#### 3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  1. Apply by brush or spray to provide a minimum **2.0-mil (0.05-mm)** dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05500

1 GENERAL

A. GENERAL REQUIREMENTS

Conform to the provisions of Part I and DIVISION 1.

B. WORK IN OTHER SECTIONS

Expansion joints in concrete, covered under Section 03100.

C. GUARANTEE

Provide a written guarantee based on model form in Section 01700 warranting caulking to be free of all defects in materials and workmanship for a period of 3 years from date of acceptance of building. Signed by subcontractor and countersigned by General Contractor. Leakage, hardening, staining, separation, crumbling, running, melting will be considered defects; replace all defective caulking at no cost to Owner. Submit as indicated in Section 01700.

D. DELIVERY

Deliver in manufacturer's original sealed containers.

E. SUBMITTALS

1. Product Data:

After award of Contract, and before caulking materials are delivered to the site, submit manufacturers' published literature for specified products and accessories as applicable, including manufacturers' specifications, physical characteristics and performance data. Submit as a supplement, manufacturers' instructions and directions for application if not included in manufacturers' published literature. Submit in accordance with Section 01340.

2. MSDS Submittals:

Within 20 days after award of Contract, and before any materials are delivered to the site, Material Safety Data Sheets (MSDS) shall be submitted on all materials/products that contain or use chemical solution for treatment or as additives and/or display Hazardous/Warning/Caution information in their products literature or on their labels.

2 PRODUCTS

A. ELASTOMER SEALANTS

1. Polysulfide: One or two component polysulfide compound produced by a manufacturer meeting "Tested and Approved" standards of the Thiokol Chemical Corporation.
2. Polyurethane: Two component polyurethane compound, which meet or exceed the cured physical requirements of ANSI 116.1-1960. "Betaseal No. 450 Pourable Joint Sealing Compound" as manufactured by Essex Chemical Corp.: "PRC Rubber Calk 210 Sealant" or "PRC Rubber Calk 220 Sealant" as manufactured by Products Research Corp.: or as approved in advance by the Architect.
3. Silicone: General Electric "Silicone Construction Sealant", or Dow-Corning "780 Building Sealant".
4. Color: As selected by Architect.
5. Concrete Tilt-up Panel Joint Sealant: The following products are approved:
  - DYNATROL II as manufactured by Pecora, a two component, non-sag, low modulus polyurethane rubber sealant which meets Federal Specification TT-S-00227E, Class A, Type II, Grade NS.
  - DYMERIC PLUS as manufactured by Tremco, a low modulus, high performance architectural expoxidized polyurethane which meets Federal Specification TT-S-00227E, Type II, Class A, Grade NS. Color as selected by Architect from manufacturer's standard colors. Provide primer prior to installation where required by manufacturer; conform to manufacturer's written instructions.

**B. CAULKING COMPOUND**

"Vulcatex" as manufactured by W.R. Grace Co., or as approved in advance by the Architect. Color as directed by Architect. Provide proof of compliance with Fed. Spec. TT-C598, grade 1.

**C. PRIMERS**

Use primers as required by manufacturers.

**D. BACKING**

Closed cell butyl sponge rod, closed cell polyurethane rod, or polyethylene foam. Dimension shall be one third larger than the joint width. Open celled foam backed shall be accompanied by masking tape to prevent adherence of sealant to backing.

**3 EXECUTION**

**A. CAULKING WITH ELASTOMER SEALANTS**

All exterior joints and all joints marked "sealant" except those included under another section.

1. Use polyurethane sealant for floor and sidewalk joints. Shore Hardness 35-40.
2. Use polysulfide or silicone at the Contractor's option at all other locations.
3. Depth of sealant not less than joint width.

**B. CAULKING WITH CAULKING COMPOUND**

Where indicated on drawings or noted by the single word "caulk". Elsewhere as necessary for interior applications.

**C. JOINT PREPARATION**

1. Concrete Surfaces:

Sandblast or rough brush to remove all dust, dirt, grease and other foreign matter.

2. Metal and Glass:

Use an oil-free solvent. Take care not to contaminate solvent supply. Use "progressing cleaning" method; i.e., wipe surface to be cleaned with solvent-soaked clean cloth and immediately wipe dry with dry cloth.

**D. APPLICATION**

Install backing rod at all locations. All materials are to be installed by skilled workmen in the following manner: Place nozzle of the gun at bottom of the joint and completely fill from the bottom so that sealant or caulking compound is extruded into the joint without the entrapment of air. Tool joint so that sealant or caulking compound is pressed into the joint and wetting of the joint interface is assured. Protect adjacent surfaces which are not to receive sealant or caulking compound by use of masking tape. Tape shall be removed immediately after sealant is applied, leaving a clean, sharp line.

**E. PROTECTION**

Protect all caulked joints for at least 24 hours. Protect from dust, moisture, and other harmful substances during installation.

**F. CLEANING**

Clean adjacent surfaces free of sealant and caulking compound or soiling; clean as work progresses. Use solvent or cleaning agent as recommended by manufacturer of sealant or caulking compound. Do not scratch or otherwise damage visible surfaces. Do not allow silicone sealants to touch glass surfaces; all glass touched by silicone shall be replaced with clean glass.

END OF SECTION