

895.1 – BRIDGE CONTROL AND MACHINERY HOUSES

Description

The provisions of this section apply to the general construction of the Control House and Machinery House, excluding electrical work, mechanical, heating, ventilating and air conditioning and plumbing. Refer to the following related sections:

- 4.0 - Structures
- 7.7 - Electrical
- 7.9 - HVAC and Plumbing

Materials and Construction Requirements

All work shall conform to the requirements outlined in the following subsections:

CONCRETE

All concrete shall be per New Hampshire Department of Transportation Standard Specifications.

STRUCTURAL STEEL

All structural steel shall be per New Hampshire Department of Transportation Standard Specifications and section 4.0 - Structures.

METALS

- 055010 Miscellaneous Metal Fabrications
- 055013 Steel Stairs and Railings

WOOD AND PLASTICS

- 061000 Rough Carpentry
- 062000 Finish Carpentry
- 064100 Architectural Cabinetwork (Millwork)

THERMAL AND MOISTURE PROTECTION

- 071326 Self Adhering Sheet Membrane Waterproofing
- 072100 Building Insulation
- 072716 Self adhering Air Barrier – Vapor Resistive
- 074214 Foam-Filled Aluminum Wall Panels
- 076113 Standing Seam Metal Roofing
- 076200 Flashing and Sheet Metal
- 078117 Fireproofing – Reference Standard Based
- 078400 Firestopping
- 079213 Exterior Joint Sealers
- 079216 Interior Joint Sealers

DOORS AND WINDOWS

081113	Hollow Metal Doors and Frames
083116	Access Panels and Doors
083123	Floor Hatch - Steel
084113	Aluminum Storefront
084413	Curtain Wall Systems
085115	Aluminum Windows – Double Hung
087100	Door Hardware
088102	Exterior Glass and Glazing
089100	Architectural Louvers

FINISHES

092127	Exterior Stud Wall System
092216	Non-Structural Metal Framing
092900	Gypsum Wallboard
093000	Tile
095100	Acoustical Materials
095300	Acoustical Suspension System
096500	Vinyl Composition Tile Flooring and Resilient Base
099100	Painting and Protective Coatings
099113	Exterior Painting

SPECIALTIES

101416	Plaques
101423	Signs
102813	Toilet and Bath Accessories
104433	Fire Extinguishers and Cabinets
105113	Metal Lockers
105700	Wardrobe Specialties
108113	Bird Control Device

FURNISHINGS

122000	Window Treatment
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Method of Measurement

Payment will be made on the contract on a lump sum basis, which shall be full compensation for all materials, labor, tools, equipment, and incidentals necessary to completely manufacture, fabricate, install, and test to the satisfaction of the Engineer.

Basis of Payment

PAY ITEMS AND UNITS

Control and Machinery Houses	Lump Sum
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SECTION 05 50 10
MISCELLANEOUS METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools, equipment, and services for Miscellaneous Metal Fabrications, as indicated, in accordance with provisions of Contract Documents.
- B. Completely coordinate with work of other trades.

1.2 QUALITY ASSURANCE

- A. Materials and operations standards:
 - 1. AAMA, Architectural Aluminum Manufacturer's Association.
 - 2. AISC, American Institute of Steel Construction.
 - 3. ASTM, American Society for Testing and Materials.
 - 4. AWS, American Welding Society.
 - 5. F.S., Federal Specifications.
 - 6. NAAMM, National Association of Architectural Metals Manufacturers.

1.3 SUBMITTALS

- A. Shop drawings.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Materials listed:
 - 1. Base: As noted.
- B. Galvanizing Repair Paint:
 - 1. Base:
 - a. ZRC Worldwide.
 - 2. Optional:
 - a. Tnemec.
- C. Shop Primer:
 - 1. Base:
 - a. Sherwin-Williams.
 - 2. Optional:
 - a. Tnemec.
- D. Coal Tar Epoxy (dissimilar material protection coating):
 - 1. Base:
 - a. Tnemec.
 - 2. Optional:
 - a. ICI Dulux Paint Centers.
- E. Non-shrink Grout:

1. Base:
 - a. Dayton Superior Corporation.
2. Optional:
 - a. Sauereisen.
 - b. Minwax.

2.2 MATERIAL

- A. Bolts: ASTM-A307, ASTM-A325, ASTM-A354.
- B. Filler metal: AWS Standards.
- C. Cast iron: ASTM-A48, Class 30, minimum 206 850 kPa 30,000 PSI tensile.
- D. Malleable iron: ASTM-A47 and ASTM-A197.
- E. Aluminum: ASTM-B308 for particular alloy in standard shapes and extrusions, ASTM-B26 for castings.
- F. Stainless steel: ASTM-A484 and ASTM-A276.
 1. Concealed: Type 302 or Type 304.
 2. Exposed: Type 304.
 - a. Finish: ASTM-A480 AISI finish #4, unless otherwise indicated.
- G. Anchorage devices - masonry:
 1. Standard manufactured items.
 2. Lead expansion shields for machine screws and bolts 6mm 1/4 IN and smaller: Head out embedded nut type.
 3. For machine screws and bolts larger than 6mm 1/4 IN: Manufacturers' standard.
 4. Bolt anchor expansion shields for lag bolts: Zinc alloy, long shield anchors.
 5. Bolt anchor expansion shields for bolts: Closed end bottom bearing type.
- H. Fasteners:
 1. Galvanized or stainless where built into exterior walls.
 2. Select fasteners for type, grade and class required.
 3. Bolts and Nuts: Regular hexagon head ASTM-A307, Grade-A.
 4. Lag Bolts: Square or octagonal head type.
 5. Machine Screws: Cadmium plated steel.
 6. Wood Screws: Flat head carbon steel.
 7. Plain Washers: Round, carbon steel.
 8. Lock Washers: Helical spring carbon steel.
- I. Non-shrink grout:
 1. Compressive strength: 48.2 MPa 9000 PSI at 7 days.
 2. Base Product: 1107 Advantage Grout by Dayton Superior.

2.3 FABRICATION

- A. Form to shapes indicated with straight lines, sharp angles, and smooth curves.
- B. Drill or punch holes with smooth edges for temporary field connections and attachment of work by other trades.
- C. Make permanent shop and field connections with continuous fillet type welds.
- D. Grind exposed welds smooth.
- E. Conceal fastenings where practicable.

- F. Shop fabricate in as large assemblies as practicable.
- G. Meet requirements specified under Structural Steel for fabricating items of structural nature or use.
- H. Qualify welding processes and welding operators in accord with AWS.

2.4 SURFACE PREPARATION AND SHOP-APPLIED COATINGS

A. General:

- 1. All items in this section shall be shop finished by one of the methods described in this article.
 - a. Exceptions:
 - 1) Do not coat surfaces scheduled to be fireproofed with spray-on material.
 - 2) Do not coat machined surfaces, surfaces adjacent to field welds, contact surfaces of bolt connections where connection is specified as slip critical and top flanges of beams to receive shear connectors.
 - 3) Do not coat other items for which no coating is specified.

B. Shop Primer for Interior (non-wet) Items:

- 1. Primer: Sherwin-Williams Pro-Cryl Universal Acrylic Primer, B66-310 Series.
- 2. Apply primer for interior finish paint to following surfaces not receiving other coating:
 - a. Surfaces exposed on interior.
- 3. Clean thoroughly before priming; remove mill scale, rust, dirt, oil, and grease in accordance with SSPC-SP3.
- 4. Apply in accordance with paint manufacturer's instructions.
 - a. Apply minimum 0.05 mm 0.002 IN, dry film thickness.
- 5. Finish Paint (applied in field): Specified in Section 09 91 23.

C. Hot-dip Galvanized (HDG) Coating for Exterior items:

- 1. Galvanize (HDG) the following items:
 - a. Items to be installed on site, roof or other areas that are "outside" of building enclosure walls. This shall include items "attached to" exterior walls of building.
 - b. Items to be installed in "wet" or humid (>70% RH) areas of building.
 - c. Partial listing of items to receive HDG:
 - 1) Masonry lintels, ledge angles and shelf angles.
 - 2) Exterior Ladders, Stairs and railings.
 - 3) Exterior gratings and substructure.
 - 4) Exterior equipment supports.
 - 5) Similar items which are exposed to weather or built-in to Exterior walls.
- 2. Clean thoroughly before galvanizing.
- 3. Galvanize in accordance with ASTM-A123.

2.5 PAINTING

- A. Paint exterior steel items (in field) as Specified in Section 09 91 13.

2.6 METAL FABRICATIONS

A. General:

- 1. Supply items required to complete construction and installation.
- 2. Minimum Workmanship Standards (unless noted otherwise): Class 1 (Architectural) per NAAMM AMP-555, Code of Standard Practice for the Architectural Industry.
- 3. Anchorage accessories:

- a. Items required to secure wood to metal, wood to masonry, metals to masonry or concrete, metal to metal or metal to other items.
4. Verify completeness of following listings:
 - B. Ladders:
 1. General:
 - a. Design to comply with the following regulations:
 - 1) ANSI-A14.3.
 - 2) OSHA 29 1910.27.
 - b. Material:
 - 1) Exterior Ladders: Galvanized steel, painted by Section 09 91 13.
 - 2) Interior Ladders: Shop-primed steel, painted by Section 09 91 23.
 - c. Side rail members: Minimum 13 x 50mm 1/2 x 2 IN.
 - d. Rungs: Minimum 22mm 7/8 IN round or square bars.
 - e. Punch rungs through side rails and weld.
 - f. Size to support concentrated moving load of 90 kg 200 LB.
 - g. Minimum clearance from centerline of rung to wall or obstruction: 180mm 7 IN.
 - h. Minimum ladder width: 405mm 16 IN between side rails.
 - i. Rung spacing: 305mm 12 IN O.C.
 - j. Apply abrasive warning tape Type 2 to top and bottom rung of all ladders.
 - C. Metal Gratings, Exterior Stair Treads, and Landings:
 1. Complying with NAAMM "Metal Bar Grating Manual."
 2. Material and Thickness (except where otherwise indicated):
 - a. Galvanized steel, nominal 38mm 1-1/2 IN thick.
 3. Load Capacity: Support minimum uniform load of 9575 Pa 200 PSF.
 4. Provide hold down clips.
 5. Serrated or slip resistant tops.
 6. Furnish with frames and support items of comparable material and finish.
 - D. Steel Support Angles, Members, Loose Lintels, and Stair Stringers:
 1. ASTM-A36 steel, Sizes and configurations as indicated.
 2. Items to be HDG (galvanized):
 - a. Items to be permanently exposed to weather, high-humidity, or wet conditions.
 - b. Items set into exterior walls.
 3. Shop Prime interior items (in non-wet areas).
 - E. Miscellaneous Equipment Supports:
 1. ASTM-A36 steel, Sizes and configurations as indicated.
 2. Examples of items included:
 - a. Supports for Folding Partitions, Operable Walls, Coiling Doors and Grilles.
 - b. Ceiling hung toilet partitions.
 - c. Other miscellaneous support items as indicated.
 3. Items to be HDG (galvanized):
 - a. Items to be permanently exposed to weather, high-humidity, or wet conditions.
 - b. Items set into exterior walls.
 4. Shop Prime interior items (in non-wet areas).

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify suitability of substrate to accept installation.

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- B. Installation constitutes acceptance of responsibility for performance.
- C. Ensure that adequate Wall Backing (as specified in Section 09 22 16) has been installed where required for wall-mounted items specified in this Section.

3.2 INSTALLATION

- A. General:
 - 1. Set work level, true to line, plumb.
 - 2. Shim and grout as necessary.
 - 3. Weld field connections and grind smooth.
 - 4. Where practical, conceal fastenings.
 - 5. Secure metal to wood with lag screws of adequate size with appropriate washers.
 - 6. Secure metal to concrete with embedded anchors, setting compounds, caulking and sleeves, or setting grout.
 - a. Use expansion bolts, toggle bolts, or screws for light duty service.
 - 7. Meet structural requirements for erecting items of structural nature.
 - 8. Do not field splice fabricated items unless size requires splicing.
 - 9. Weld splices.
 - 10. Provide fabricated items complete with attachment devices as required to install.
- B. Galvanic Repair:
 - 1. After galvanized units have been erected and anchored apply galvanizing repair paint in accordance with manufacturer's recommendations.
 - 2. Surface preparation: Remove contaminates in accord with SSPC SP-1.

3.3 FIELD PAINTING

- A. All items in this section which are exposed to view:
 - 1. Painting of exterior items: Specified in Section 09 91 13.
 - 2. Painting of interior items: Specified in Section 09 91 23.

END OF SECTION