

**1.0 GENERAL**

- 1.1 Conditions
- 1.2 General Information
- 1.3 Related Work
- 1.4 References

**2.0 PRODUCTS**

- 2.1 General
- 2.2 Steel
- 2.3 Stainless Steel
- 2.4 Aluminum
- 2.5 Related Materials and Procedures
- 2.6 Finishes

**3.0 EXECUTION**

*(not applicable)*

**4.0 METAL THICKNESS CHARTS**

- 4.1 Steel Studs
- 4.2 Galvanization Coatings

1 - Issued for Tender (2015-05-20)

Prepared by: P.D.P.	Reviewed by: R.S.	Approved by: M.S.
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1.0 GENERAL

1.1 Conditions

- .1 **Acceptable materials or products:** When materials or products are prescribed by their trademark, consult **Instructions to Bidders** regarding the request for approval of materials or substitutes.

1.2 General Information

- .1 This Section covers all basic metal materials, related products and finishes required for metal fabrications.
- .2 This Section is to be referred to by all Sections incorporating metal items, unless otherwise indicated, for the description of basic metal materials, related products and finishes.
- .3 If need be, modify the aluminum temper and alloy to suit the specified finishes, and obtain the Departmental Representative's approval.
- .4 Certain materials and finishes may not be applicable to this Project. See the **Sections concerned** for applicable products.

1.3 Related Work

- |    |                                   |                  |
|----|-----------------------------------|------------------|
| .1 | Metal work                        | Section 05 50 00 |
| .2 | Metal framing parapets            | Section 05 41 00 |
| .3 | Membrane roofing                  | Section 07 52 00 |
| .4 | Roof drains                       | Mechanical       |
| .5 | Mechanical equipment and conduits | Mechanical       |
| .6 | Electrical equipment              | Electrical       |
| .7 | Existing surfaces                 |                  |

1.4 References

- .1 Comply with all standards in this specification, unless more stringent requirements are given herein.
- .2 See **Section 01 41 00** for legend of standards.

2.0 PRODUCTS

2.1 General

- .1 Any Manufacturer name, supplier, or product model mentioned below is provided solely as minimum base quality reference.

2.2 Steel

- .1 Type ST.PR – Steel sections and other elements, primed, finish Type PR.ST,
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- Type ST.PR/STR – Structural steel sections and other elements, primed, finish Type PR.ST,  
Type ST.GV – Steel sections and other elements, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.GV/STR – Structural steel sections and other elements, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.GV/PP – Steel sections and other elements, galvanized and prepainted, finish Types GV.F.1 or GV.F.2 and Types PP.F.1 or PP.F.5, as indicated,  
Type ST.PP – Steel Sections and other elements, prepainted, finish Types PP.F.1 or PP.F.5, as indicated:  
as per ASTM A36/A36M, A572/A572M, or CAN/CSA-G40.20/G40.21, Grade 350W (structural elements), 300W (channels) and 260W (plates).
- .2 Type ST.PR/BR – Steel bars, primed, finish Type PR.ST,  
Type ST.GV/BR – Steel bars, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.GV/PP/BR – Steel bars, galvanized and prepainted, finish Types GV.F.1 or GV.F.2 and Types PP.F.1 or PP.F.5, as indicated:  
as per ASTM A36/A36M, square, in mild steel, hot rolled- grade 44W.
- .3 Type ST.PR/P – Steel pipes, primed, finish Type PR.ST,  
Type ST.GV/P – Steel pipes, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.GV/PP/P – Steel pipes, galvanized and prepainted, finish Types GV.F.1 or GV.F.2 and Types PP.F.1 or PP.F.5, as indicated,  
Type ST.PP/P – Steel pipes, prepainted, finish Types PP.F.1 or PP.F.5, as indicated:  
as per ASTM A53/A53M, standard weight, series 40 or extra-strength, seamless black.
- .4 Type ST.PR/T - Steel tubes, primed, finish Type PR.ST,  
Type ST.PR/T/STR - Structural steel tubes, primed, finish Type PR.ST,  
Type ST.GV/T - Steel tubes, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.GV/T/STR - Structural steel tubes, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.GV/PP/T - Steel tubes, galvanized and prepainted, finish Types GV.F.1 or GV.F.2 and Types PP.F.1 or PP.F.5, as indicated,  
Type ST.PP/T - Steel tubes, prepainted, finish Types PP.F.1 or PP.F.5, as indicated:  
as per ASTM A36/A36M, A572/A572M, or CAN/CSA-G40.20/G40.21, Grade 350W, also as per ASTM A513.
- .5 Type ST.PL/PR – Cold-formed steel sheets and other elements, primed, finish Type PR.ST,  
Type ST.PL/GV – Cold-formed steel sheets and other elements, galvanized, finish Types GV.F.1 or GV.F.2, as indicated,  
Type ST.PL/GV/PP – Cold-formed steel sheets and other elements, galvanized and prepainted, finish Types GV.F.1 or GV.F.2 and Types PP.F.1 or PP.F.5, as indicated,  
Type ST.PL/PP – Cold-formed steel sheets and other elements, prepainted, finish Types PP.F.1 or PP.F.5, as indicated:  
as per ASTM A653/A653M, ASTM A1008/A1008M or CSA S136, thickness as indicated.
- .6 Type ST.PL/PR/AS – Cold-formed antiskid steel plates, primed, finish Type PR.ST,  
Type ST.PL/GV/AS – Cold-formed antiskid steel plates, galvanized, finish Types GV.F.1 or GV.F.2, as indicated:  
as per ASTM A653/A653M, ASTM A1008/A1008M or CSA S136, thickness as indicated, with
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raised-pattern antiskid surface.

## 2.3 Stainless Steel

- .1 Type SST.1 – Stainless steel sheets and other elements: as per ASTM A167, Grades 304, 304L, 316, 316L or 434 (AISI), with finishes Types SS.F.1 or SS.F.2, or as indicated.
- .2 Type SST.1/AS – Stainless steel plates, antiskid: similar to Type SST.1, but with non-slip surface.
- .3 Type SST.1/BR – Stainless steel bars: as per ASTM A276, grade 304 of AISI, with finishes Types SS.F.1 or SS.F.2, or as indicated.
- .4 Type SST.1/P – Stainless steel pipes: as per ASTM A814/814M, grade 304 of AISI, with finishes Type SS.F.1 or SS.F.2, or as indicated.
- .5 Type SST.1/R – Stainless steel rods: as per ASTM A555/A555M, grade 302 of AISI, with finishes Types SS.F.1 or SS.F.2, or as indicated.
- .6 Type SST.1/T – Stainless steel tubes: as per ASTM A269 or ASTM A450-A450M, grade 304 of AISI, with finishes Type SS.F.1 or SS.F.2, or as indicated.
- .7 Type SST.1/W – Stainless steel rope wire: cables, as per ASTM A492, with finishes Types SS.F.1 or SS.F.2, or as indicated.

## 2.4 Aluminum

- .1 Type AL.AN.3 – Aluminum, anodized plates and panels: AA-5005-H14 alloy and temper, anodized quality, "stretcher level", minimum 3 mm ( $\frac{1}{8}$ ") thick or as indicated, with Types AN.F.1 or AN.F.2 finish, as indicated.
  - .2 Type AL.AN.4 – Aluminum, anodized sheets: AA-5005-H-14 alloy and temper anodized quality, "stretcher level", minimum 0.91 mm (0.036") (20 ga.) thick or as indicated, with Types AN.F.1 or AN.F.2 finish, as indicated.
  - .3 Type AL.AN.5 – Aluminum, anodized extruded sections: AA-6063-T5 alloy and temper, for general use and AA-6061-T54 alloy and temper for semi-structural use; profiles and dimensions as indicated; with Types AN.F.1 or AN.F.2 finish, as indicated.
  - .4 Type AL.AN.5/STR – Structural aluminum, anodized extruded sections: AA-6061-T6 alloy and temper, with Types AN.F.1 or AN.F.2 finish, as shown; profiles and dimensions as indicated.
  - .5 Type AL.AN.5/T – Aluminum, anodized extruded tubes: AA-6061-T6 alloy and temper, dimensions as indicated; with Types AN.F.1 or AN.F.2 finish, as indicated.
  - .6 Type AL.MF.3 – Aluminum, mill-finish plates and panels: AA-5005-H14 alloy and temper, anodized quality, "stretcher level", minimum 3 mm ( $\frac{1}{8}$ ") thick or as indicated, with Type MF.AL finish.
  - .7 Type AL.MF.3/AS – Aluminum, mill-finish plates and panels, antiskid: similar to Type AL.MF.3, but with raised- pattern antiskid surface.
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- .8     Type AL.MF.4 – Aluminum, mill-finish sheets: AA-5005-H14 alloy and temper, "stretcher level", minimum 0.81 mm (0.032") thick or as indicated, with Type MF.AL finish.
- .9     Type AL.MF.4/AS – Aluminum, mill-finish sheets, antiskid: similar to Type AL.MF.4, but with "Rice Pattern" antiskid surface, AA-6351-T6 alloy and temper, minimum 1.6 mm (1/16") thick or as indicated.
- .10    Type AL.MF.5 – Aluminum, mill-finish extruded sections: AA-6063-T5 alloy and temper for general use and AA-6061-T54 alloy and temper for semi-structural use, mill finish, Type AL.MF, profiles and dimensions as indicated.
- .11    Type AL.MF.5/STR – Structural aluminum, mill-finish extruded sections: AA-6061-T6 alloy and temper, with Type MF.AL finish; profiles and dimensions as indicated.
- .12    Type AL.MF.5/T – Aluminum, mill-finish extruded tubes: AA-6061-T6 alloy and temper, dimensions as indicated; with Type MF.AL finish.
- .13    Type AL.PP.3 – Aluminum, prepainted plates and panels: AA-5005-H14 alloy and temper, prepainted quality, "stretcher level", minimum 3 mm (1/8") thick or as indicated, with Type PP.F.3A finish unless otherwise indicated.
- .14    Type AL.PP.4 – Aluminum, prepainted sheets: AA-5005-H14 ou AA-3003-H14 alloy and temper, prepainted quality, "stretcher level", minimum 0.91 mm (0.036") (cal. 20) thick or as indicated, with Type PP.F.3A finish unless otherwise indicated.
- .15    Type AL.PP.5 – Aluminum, prepainted extruded sections: AA-6063-T5 alloy and temper, or general use and AA-6063-T54 alloy and temper for semi-structural use; profile and dimensions as indicated; with Type PP.F.3A finish unless otherwise indicated.
- .16    Type AL.PP.5/STR – Structural aluminum, prepainted extruded sections: AA-6061-T6 alloy and temper, with Type PP.F.3A finish unless otherwise indicated; profiles and dimensions as indicated.
- .17    Type AL.PP.5/T – Aluminum, prepainted extruded tubes: AA-6061-T6 alloy and temper, dimensions as indicated; with Type PP.F.3A finish unless otherwise indicated.

## 2.5 Related Materials and Procedures

- .1     Type ADH.1 – All-purpose adhesive for construction: polyurethane based adhesive, of high bonding strength, or based on other ecological products, without solvent.
  - Acceptable products:
    - .1     "Lepage Bulldog Grip – PL Premium" by Henkel.
    - .2     "555 Total Adhesive" by NuFlex Sealants.
    - .3     As manufactured by Liquid Nails.
    - .4     Substitute products: approved by addendum in accordance with the Instructions to Bidders.
- .2     Type ADH.1A – Solvent-based contact cement adhesive: contact adhesive, solvent-, rubber- and resin-, or neoprene compound-based or other proprietary materials, applied by roller, brush, or spray (for metals, plastic laminates, etc.).
  - Acceptable products:

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- .1 As manufactured by Franklin International.
    - .2 As manufactured by Henkel.
    - .3 As manufactured by Liquid Nails.
    - .4 Substitute products: approved by addendum in accordance with the **Instructions to Bidders**.
  - .3 Type ADH.1B – Latex-based contact cement adhesive: contact adhesive, water and synthetic rubber latex-based, high solids, applied by roller brush or spraying, (for plastic laminates, etc.).
    - Acceptable products:
      - .1 "Fastbond 2000-NF with Spray Activator # 1" by 3M.
      - .2 "Cap 95" by Liquid Nails.
      - .3 "Lepage Pres-Tite Green" by Henkel.
      - .4 Substitute products: approved by addendum in accordance with the **Instructions to Bidders**.
  - .4 Type M.PUT – Metal putty: aluminum filled, single component, standard metal repair and patching compound, drying to hardness 80 on Shore D scale.
  - .5 Type MORT.7 – Grout for metal work: non-shrink, non-metallic, fluid, with 26 MPa (3770 lb/in<sup>2</sup>) resistance at 24 h as per CAN/CSA-A23.1/A23.2.
  - .6 Type BPT – Bituminous metal paint: bituminous and water resistant coating, non fibrous, solvent based, as per CGSB 37-GP-6Ma.
  - .7 Welding materials: as per AWS or CSA W59 for steel and CSA W59.2 for aluminum, of the same composition as materials to be welded, certified by the Welding Institute of Canada.
  - .8 Welding electrodes: to CSA W48 Series.
  - .9 Welding procedures: as per AWS or CSA W47.1 and W47.1S1 – Suppl.1 for steel and CSA W47.2 for aluminum.

## 2.6 Finishes

- .1 Type MF.AL – Mill-finish of aluminum: natural, rolled surface, untreated finish of aluminum.
  - .2 Type AN.F.1 – Anodized finish, clear: an uncoloured anodic oxide treatment in conformity with Aluminum Association Specification AA-M12/C22/A41 for aluminum work, as indicated, 18 microns (0.7 mil) thick, on surfaces treated with a caustic etch and cleaned as per ASTM B449 (Section 5) and ASTM D1730, Type B, Method 5 or 7. Execute preparation and anodization after assembling and welding aluminum elements.
  - .3 Type AN.F.2 – Anodized finish, coloured: a coloured anodic oxide treatment in conformity with Aluminum Association Specification AA-M12/C22/A44, Class 1, for aluminum work, as indicated, 18 microns (0.7 mil) thick, on surfaces treated with a caustic etch and cleaned as per ASTM B 449 (Section 5) and ASTM D 1730, Type B, Method 5 or 7. Execute preparation and anodization after assembling and welding aluminum elements. Colour choice by Consultants from manufacturer's standard range of colors.
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- .4     Type CN.F.1 – Chrome and nickel-plated satin finish: as per ASTM B456.
  - .5     Type CN.F.2 – Chrome and nickel-plated glossy finish: as per ASTM B456.
  - .6     Type GV.F.1 – Galvanized finish Type 1: hot-dipped, as per CAN/CSA-G164, ASTM A123/A123M, and ASTM A153/A153M with 600 g/m<sup>2</sup> (2 oz/ft<sup>2</sup>) zinc coating, or as the industry standards, unless otherwise indicated.
  - .7     Type GV.F.2 – Galvanized finish Type 2: hot dipped, "Z275" ("G90") zinc coating, as per ASTM A653/A653M.
  - .8     Type GV.F.3 – Galvanized finish, aluminium-zinc: hot-dipped aluminum-zinc standard coating "AZ180", as per ASTM A792/A792M, with an additional clear organic resin protective coating on both faces.
  - .9     Type GV.F.4 – Galvanized finish, wiped: of "ZF075" zinc coating designation as per ASTM A653/A653M, for interior doors and frames.
  - .10    Type GV.F.5 – Galvanized finish, Galvanneal: hot-dipped, with "ZF001" designation coating, GR33 as per ASTM A653/A653M.
  - .11    Type GV.F.6 – Galvanized finish, painted-on: as per CAN/CGSB-1.181 or SSPC-Paint 20.
  - .12    Type SS.F.1 – Stainless steel satin finish: brush satin vertical grain finish #4, as per AISI specifications.
  - .13    Type SS.F.2 – Stainless steel polished finish: finish #2B, as per AISI specifications.
  - .14    Type SS.F.3 – Stainless steel electropolished finish: finished with electropolishing method.
  - .15    Type MF.SS –Stainless steel mill-finish: natural, untreated finish of stainless steel, without applied finishing.
  - .16    Type PP.F.1 – Prepainted silicone polyester coating finish, for metal surfaces: enamel, with ceramic and other inorganic oven-baked pigments, 25 microns (1 mil) dry film thickness.
  - .17    Type PP.F.2 – Prepainted PVC coating finish, for metal surfaces: polyvinyl chloride enamel, factory applied, on a special flat primer, oven baked, of thickness indicated.
  - .18    Type PP.F.3A – Prepainted fluoropolymer coating finish for aluminum or steel surfaces: polyvinylidene fluoride coating, baked, factory applied, as per AAMA 605.2, three (3) coats, a minimum dry film thickness of 50.8 microns (2.0 mils), on surfaces treated with a pretreatment and cleaning as per ASTM B-449, Section 5 and ASTM D-1730, Type B, Method 5 or 7.
    - .1     Primer coat: minimum 5.1 - 7.6 microns (0.2 - 0.3 mil);
    - .2     Pigmented base coat: minimum 25.4 microns (1.0 mil);
    - .3     Transparent finish coat: 10.15 - 20.3 microns (0.4 - 0.8 mil).
  - .19    Type PP.F.3B – Prepainted acrylic coating finish for aluminum or steel surfaces: a thermosetting acrylic baked enamel, of 20 micron (0.8 mil) total dry film thickness, as per AAMA 603, on surfaces
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treated and cleaned as per ASTM B 449, Section 5 and ASTM D 1730, Type B, Method 5 or 7; colour to match, or existing (Middle Bronze # K-70633).

- .20 Type PP.F.3C – Site applied fluoropolymer coating finish for aluminum surfaces site applied for aluminum or steel surfaces: on surfaces cleaned as per the manufacturer's recommendations; a two-component fluoropolymer resin coating, composed of:
  - .1 Two primer coats: minimum 33 microns (1.3 mil) dry film thickness.
  - .2 Two finish coats: 38-51 microns (1.5-2.0 mil) dry film thickness.
- .21 Type PP.F.3D – Prepainted polyester powder coating finish for aluminium or steel surfaces: as per AAMA 2604, high performance, very resistant to the atmosphere and UV rays, smooth and glossy, 60-80 microns (2.5 - 3.5 mils) dry film thickness, on surfaces treated and cleaned as per ASTM B449.
- .22 Type PP.F.3E – Prepainted polyurethane coating finish for aluminium or galvanized steel surfaces: Polyurethane coating, applied by hot dip process according to AAMA 2605 standards, three (3) coats, with a total dry film thickness of at least 35.0 microns (1.378 mils) on the face and 11.25 microns (0.443 mils) to the back, on surfaces that have been pretreated with zinc phosphate and cleaning in accordance with ASTM B-449, Section 5 and ASTM D-1730, Type B, method 5 or 7.
- .23 Type PP.F.4A – Prepainted coating finish for special steel doors:
  - .1 Pre-treatment and cleaning of steel according to the following procedure:
    - .1 Zinc phosphate pre-treatment.
    - .2 Iron phosphate pre-treatment.
    - .3 Sandblasting to remove surface oil.
    - .4 Cleaning with "#804".
  - .2 Primer: compatible with finish, 2 component zinc chromate vinyl, "#69-595" and "69-009" by Denalt.
  - .3 Finish coat: 2 components acrylic polyurethane enamel with a certified thickness of 50 microns (2 mils)
  - .4 Colours: to be selected by the Consultants.
- .24 Type PP.F.4B – Prepainted coating finish for special aluminum doors:
  - .1 Pretreatment and cleaning of aluminum as per ASTM B-449 and ASTM D-1730.
  - .2 Primer, compatible with finish, 28 microns (1.1 mil) thick.
  - .3 Finish coat of polyurethane with a certificated thickness of 50 microns (2 mils).
  - .4 Colours: to be selected by the Departmental Representative for exterior, white for interior.
- .25 Type PP.F.5 – Prepainted baked enamel coating finish for metal surfaces: shop applied to carefully cleaned sheet steel, degreased and neutralized with phosphate or chromate treatment, and finished with a heavy duty powder coating, baked in such a manner as to produce a smooth and uniform surface, 60 -65% glossy, as per CAN/CGSB-1.300 and AAMA 603.8; having successfully passed salt spray testing for 400 hours, as per ASTM B117.
- .26 Type PP.F.6 – Prepainted finish for wire mesh partitions: special finish type 2 by manufacturer, bright enamel, conforming to CAN/CGSB-1.300, standard colour.
- .27 Type PR.ST.1 – Primer for steel surfaces, Type 1 and Type PR.TU/PR.1 – Touch-up primer for primed steel surfaces, Type 1: for a shop applied coat, as per CAN/CGSB-1.40, or FS-TT-P-645



and CISC (CPMA) 1-73a, beige colour; also used as touch-up primer.

- .28 Type PR.ST.2 – Primer for steel surfaces, Type 2 and Type PR.TU/PR.2 – Touch-up primer for primed steel surfaces, Type 2: for a shop applied coat, as per GS-11 standard, water based acrylic, 0 VOC; also used as touch-up primer.
- .29 Type PR.ST.3 – Primer for steel surfaces, Type 3 and Type PR.TU/PR.3 – Touch-up primer for primed steel surfaces, Type 3: for a shop applied coat, as per UL 263 and ASTM E119, aromatic polyurethane base, filled with mica iron oxide and zinc, humidity cured; also used as touch-up primer.
- .30 Type PR.TU/GV – Touch-up primer for galvanized steel surfaces: as per CAN/CGSB-1.181, or SSPC-Paint 20 matt, brush applied or glossy by an aerosol spray.

### 3.0 EXECUTION (non applicable)

### 4.0 METAL THICKNESS CHARTS

#### 4.1 Steel Studs

Épaisseur min. de métal nu * Min. base metal thickness *		Épaisseur désignée Designation thickness	Calibre corresp. (n/a) (périmé) Corresp. gage (n/a) (obsolete)	Couleur d'identification Identification colour
mm	Pouces/inches			
0.455	0.0179	18	25	-
0.836	0.0329	33	20	blanc / white
1.087	0.0428	43	18	jaune / yellow
1.367	0.0538	54	16	vert / green
1.720	0.0677	68	14	orange / orange
2.454	0.0966	97	12	rouge / red
2.997	0.1180	118	10	bleu / blue

\* 95% de l'épaisseur de calcul / 95% of design thickness

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#### 4.2 Galvanization Coatings

Identification du devis	Specification Identification	Identification métrique / Metric Designation	Épaisseur min. en mm / Min. Thickness in mm	Identification impériale / Imperial Designation	Épaisseur min. en pouces / Min. Thickness in inches
		Z120	0.018	G40	0.0007
		Z180	0.025	G60	0.001
F.GV.2	GV.F.2	Z275	0.04	G90	0.0015
		AZM150	0.04	AZ50	0.0016
		AZM165	0.045	AZ55	0.0018
F.GV.3	GV.F.3	AZM180	0.05	AZ60	0.002

End of Section

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**1.0 GENERAL**

- 1.1 General clauses
- 1.2 Related works
- 1.3 Reference standards
- 1.4 Source quality control
- 1.5 Design of details and connections

**2.0 PRODUCTS**

- 2.1 Materials

**3.0 EXECUTION**

- 3.1 Fabrication
- 3.2 Connection to existing work
- 3.3 Shop painting
- 3.4 Marking
- 3.5 Erection
- 3.6 Field quality control

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Prepared by: S.V.		Approved by: S.V.
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**PART 1 - GENERAL****1.1 General clauses**

- .1 General Clauses and Complementary General Clauses apply to works described in this section.

**1.2 Related works**

- .1 Steel deck Section 05 31 00

**1.3 Reference standards**

- .1 Conform to most recent edition of the following codes and standards
- .2 Do structural steel work in accordance with CSA-S16-01, except where specified otherwise.
- .3 Do welding in accordance with CSA W59, except where specified otherwise.
- .4 Welder certification: in accordance with ACNOR W47.1.
- .5 Steel Sub-Contractor to be a certified member of CWB (section 2.1) as per CSA W47.1 standard.

**1.4 Source quality control**

- .1 If required by Engineer, submit two (2) certified copies of mill reports covering chemical and physical properties of steel used in this work.

**1.5 Design of details and connections**

- .1 Design details and connections in accordance with requirements of CSA S16-01 to resist loads indicated.
- .2 Engineer may require welding procedures for examination.

**1.6 Shop drawings**

- .1 N/A
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**PART 2 - PRODUCTS****2.1 Materials**

- .1 Structural steel: to CAN/CSA-G40.21, grade as indicated on structural drawings. HSS to be as per ASTM A500 grade C.
- .2 Anchor bolts: to CAN/CSA-G40.21.
- .3 Bolts, nuts and washers: to ASTM A325M.
- .4 Welding materials: to ACNOR W59.
- .5 Shop paint primer: to 1-73a.
- .6 Hot dip galvanizing: where indicated, galvanize steel to ACNOR G164, minimum zinc coating of 600 g/m<sup>2</sup>.

**PART 3 - EXECUTION****3.1 Fabrication**

- .1 Fabricate structural steel, as indicated, in accordance with CSA-S16-01 and in accordance with shop drawings.
- .2 Provide punched holes from 11 to 27 mm in diameter for attachment of other work. Refer to drawings for details and locations.
- .3 Reinforce openings to maintain required design strength.

**3.2 Connection to existing work**

- .1 Verify dimensions of existing work before commencing fabrication.

**3.3 Shop painting**

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CSA-S16-01, except where members are to be encased in concrete.

**3.4 Marking**

- .1 Mark materials in accordance with CAN/CSA-G40.20. Do not use die stamping. The use of a punch is permitted only for material with a thickness over 20 mm. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
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- .2 Match marking: shop mark bearing assemblies and joints for fit and match.

### 3.5 Erection

- .1 No structural steel element is to be installed before Engineer has examined the signed and sealed shop drawings and erection drawings (see 1.6).
- .2 Erect structural steel as indicated in accordance with CSA-S16-01 and in accordance with shop drawings. Steel framework shall be erected straight and plumb within specified tolerances. Temporary bracing shall be installed and be kept in place so long as required by the safety of the work. Erection tolerances shall not exceed those specified in the CSA-S16-01.
- .3 If indicated on drawings, seal members by continuous welds. Grind smooth.
- .4 No welding is to be done when ambient temperature is below -18o C without Engineer's approval.
- .5 Obtain written permission of Engineer prior to field cutting or altering of structural members not shown on drawings.
- .6 Touch-up shop primer to bolts, rivets, welds and burned or scratched surfaces a completion of erection.
- .7 Sauf indication contraire, serrer les boulons haute résistance de façon à obtenir un contact ferme entre toutes les couches en contact ("Snug Tight"). Les boulons indiqués aux plans à être pré-tensionnés ou dont l'assemblage est spécifié "par friction" seront serrés à l'aide d'une clé calibrée ou selon la méthode du tour d'écrou de façon à obtenir la tension minimale telle que spécifiée dans la clause 23.4 de la norme S16-01. Se référer aux clauses 23.5 et 23.6 de la norme S16-01 pour les méthodes de serrage des boulons.

Unless otherwise indicated, tighten high strength bolts to obtain a firm contact between all layers in contact ("snug tight"). Bolts indicated on drawings to be pre-tensionned or that the connexion is indicated to be "friction type" are to be tightened with a direct tension indicator or according to the turn-of-nut method to obtain tensions in bolts as specified in clause 23.4 of S16-01 standard. Refer to clauses 23.5 and 23.6 of S16-01 standard for tightening methods.

### 3.6 Field quality control

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Engineer.
- .2 Engineer may require inspections and/or testing of welds to be carried out by a specialist designated by Engineer.
- .3 Owner will pay cost of tests.

**End of Section**

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**1.0 GENERAL**

- 1.1 General clauses
- 1.2 Related works
- 1.3 Reference standards
- 1.4 Shop drawings

**2.0 PRODUCTS**

- 2.1 Materials

**3.0 EXECUTION**

- 3.1 Erection
- 3.2 Openings and areas of concentrated loads
- 3.3 Connections

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Prepared by: S.V.		Approved by: S.V.
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**PART 1 - GENERAL****1.1 General clauses**

- .1 General Clauses and Complementary General Clauses apply to works described in this section.

**1.2 Related works**

- .1 Structural Steel Section 05 12 23

**1.3 Reference standards**

- .1 Do design, fabrication and erection in accordance with ACNOR S136.
- .2 Do steel decking work in accordance with "Canadian Sheet Steel Building Institute Standards for Steel Roof Deck".
- .3 Do welding in accordance with ACNOR W59-M except where specified otherwise.
- .4 Fabricator certification: in accordance with ACNOR W47.1.

**1.4 Shop drawings**

- .1 Submit shop drawings in accordance with Section 01 33 00.
- .2 Each drawing submitted shall bear the signature and stamp of a qualified professional engineer registered in the province of Quebec.
- .3 Clearly indicate decking plan, profile, dimensions, core thickness, connections to supports and spacings, projections, openings, and reinforcement details and accessories.
- .4 Do not submit shop drawings by fax or e-mail.

**PART 2 - PRODUCTS****2.1 Materials**

- .1 Sheet steel: to ASTM A653/A653M and galvanized to ASTM A653/a653M, with Z275.
  - .2 Cover plates, cell closures and flashings: galvanized steel sheet with minimum steel core thickness of 0.76 mm.
  - .3 Primer: zinc rich.
-



## PART 3 - EXECUTION

### 3.1 Erection

- .1 Erect metal decking as indicated to manufacturer's instructions.
- .2 The steel deck shall span continuously over at least 3 spans wherever possible.
- .3 Attach steel deck to the steel framework by welds spaced at a maximum distance of 300 mm.
- .4 Touch-up primer to burned or scratched deck areas at completion of erection.

### 3.2 Openings and areas of concentrate loads

- .1 Framing of deck openings 150 to 300 mm shall be as recommended by manufacturer except as otherwise indicated.  
  
No reinforcement required for openings cut in deck which are smaller than 150 mm square.
- .2 For deck openings over 300 mm side and for areas of concentrated load, reinforce in accordance with structural framing details.

### 3.3 Connections

- .1 Mechanically fasten side joints at maximum 600 mm centres.
- .2 Side joints shall be made over a support and will make an overlap of at least 50 mm.
- .3 In case of discrepancy between drawings and these specifications, priority is given to the drawings

**End of Section**

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**1.0 GENERAL**

- 1.1 Conditions
- 1.2 General Information
- 1.3 Related Work
- 1.4 References
- 1.5 Design Criteria
- 1.6 Submittals
- 1.7 Qualifications (P.Q.)
- 1.8 Delivery, Handling and Storage
- 1.9 Waste Treatment

**2.0 PRODUCTS**

- 2.1 General
- 2.2 Type ST.STD.2/GV – Exterior Steel Structural Stud System, Galvanized
- 2.3 Type S.GRT/GVW – Galvanized steel sub-girts for walls
- 2.4 Sheathing Board
- 2.5 Parapets and Curbs
- 2.6 Type FAST.2 - Fasteners for Exterior Stud System

**3.0 EXECUTION**

- 3.1 General
- 3.2 Installation of Parapets and Curbs
- 3.3 Cleaning

1 - Issued for Tender (2015-05-20)

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Reviewed by: R.S.

Approved by: M.S.

1.0 GENERAL

1.1 Conditions

- .1 Division 01 – General Requirements shall be read in conjunction with and shall govern this Section.
- .2 **Acceptable materials or products:** when materials or products are prescribed by their trademark, consult **Instructions to Bidders** regarding the request for approval of materials or substitutes.

1.2 General Information

- .1 This Section covers all lightweight materials, equipment, tools and labour required for the supply and installation of metal framing parapets, complete with all accessories.
- .2 See **Section 05 05 00** for description of basic metal materials and finishes, and welding procedures, and for thicknesses of metals and galvanized coatings.
- .3 Unless otherwise instructed, certain related products, specified elsewhere as indicated, are to be supplied and installed by this Section for the work of this Section.

1.3 Related Work

- |    |                                    |                  |
|----|------------------------------------|------------------|
| .1 | Demolition and repairs             | Section 02 41 99 |
| .2 | Basic metal materials and finishes | Section 05 05 00 |
| .3 | Metal work                         | Section 05 50 00 |
| .4 | Membrane roofing                   | Section 07 52 00 |
| .5 | Mechanical                         | Mechanical       |
| .6 | Electrical                         | Electrical       |
| .7 | Existing surfaces                  |                  |

1.4 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 See **Section 01 41 00** for legend of standards.

1.5 Design Criteria

- .1 The calculations for the wind-load bearing stud system shall be done by a professional engineer, member in good standing of provincial association of engineers.
  - .2 The calculations shall be based on the principles of limit states design, using weighed loads and resistances.
  - .3 The calculations shall be determined in conformity with the prescriptions of the NBC and CSA S136; nonetheless, the walls should resist a minimum of 1.25 kPa positive and negative wind pressure.
-

- .4 Calculate adequate bracings to prevent rotation and translation of the elements when the stud system is subjected to wind loads.
- .5 Parapets must withstand a tensile force of at least 223 kg / m (150 lb / ft), linear measure of parapet.
- .6 Types of fasteners used must be bolts, welds and sheet metal screws. The resistance of metal screws must be based on the minimum values taken determined in accordance with CSA S136.

#### 1.6 Submittals

- .1 Submit the documents and elements as per **Section 01 33 00-T**, taking also into consideration the following precisions:
  - .1 Shop drawings (S.D.): shop drawings shall be signed and stamped by a professional engineer registered in the province, and must include the calculations.

#### 1.7 Qualifications (P.Q.)

- .1 Welders to be accredited from the Canadian Welding Bureau, in accordance to CSA W47.1/W47.1-S1 - Suppl.1 requirements for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.
- .2 Provide proof of certification.

#### 1.8 Delivery, Handling and Storage

- .1 Deliver materials to job site in perfect condition, uniform shape and size, and free of chips, cracks or broken corners.
- .2 Store under waterproof cover on pallets or plank platforms, protected from the sun rays and contamination due to corrosion or other damage from work on site, and in such a manner as to avoid deflection.
- .3 Handle with care, avoiding chipping of edges or any damage to the surface of the boards.
- .4 Remove damaged material from site.

#### 1.9 Waste Treatment

- .1 Waste treatment to be done as per **Section 01 74 21**.

#### 2.0 PRODUCTS

##### 2.1 General

- .1 Any name of an acceptable manufacturer, supplier or product model mentioned below is given only as a reference for a minimum level of quality.
-

2.2 Type ST.STD.2/GV – Exterior Structural Steel Stud System, Galvanized

- .1 Cold rolled steel studs: as per CSA S136, fabricated from Type ST.PL/GV zinc coated steel with Type GV.F.2, depth as indicated, with 41 mm (1½") flange and 12.7 mm (2") lips. Minimum steel thickness of 1.22 mm (18 ga).
- .2 Colour code steel studs in accordance with CSSBI 50M.
- .3 Stud tracks: fabricated from same material and finish as steel studs, depth to suit, but minimum as indicated.
  - .1 Bottom track: single piece.
  - .2 Top track: single piece, unattached to studs.
- .4 Nailing base: sheet steel Type ST.PL/GV, 76 mm (3 ") wide, 1367 mm (0.0538") thick base metal, galvanized coating Type F.GV.2.
- .5 Stiffeners and accessories: as recommended by the manufacturer.
- Acceptable products: as manufactured by:
  - .1 Bailey (BMP).
  - .2 Scafco.
  - .3 Winroc.
  - .4 Substitutes: approved by addendum in accordance with the **Instructions to Bidders**.

2.3 Type S.GRT/GV/W – Galvanized steel sub-girts for walls

- .1 Sub-girts of adequate thickness, min. 1.087 mm (0.0428 ") or more, according to the prescribed loads.
- .2 Profiles "L", "C", "Z" or Omega, galvanized sheet type F.GV.2, 100 mm (4 ") steel and 25 mm (1") deep, or as indicated.
- .3 All must conform to ASTM A653/A653M, Grade "A", zinc coating, Type F.GV.2, cold formed and of adequate thickness to withstand the loads specified.

2.4 Sheathing Board

- .1 Type FCEM.BD.1 – fiber-cement board: polymerized fiber-cement panel, smooth-faced, 10.67 mm (0.42") thickness, 12.69 kg/m<sup>2</sup> (2.6 lb/sq.ft.).
- .2 Type RC.BD – Asphalt core re-cover board: see Section 07 52 00.

2.5 Parapets and Curbs

- .1 Type ST.PL/GV – Cold-formed steel sheets and other elements, galvanized: see Section 05 05 00
  - .2 Type ST.STD.2/GV – Exterior structural steel stud system, galvanized: see **above**.
-

- .3 Type M.FUR.2 – Metal furring, for application with rigid insulation: "T" or "L" shaped, galvanized, for drywall or cement board installation, with fasteners as per manufacturer's recommendation.
- .4 Type S.GRT/GV/W – Galvanized steel sub-girt system for walls: see **above**.
- .5 Type FCEM.BD.1 – fiber-cement board: see **above**.
- .6 Type INSUL.1/W – extruded polystyrene board wall insulation: as per CAN/ULC-S701 type 4 RSI = 0.88 / 25 mm (R = 5 / 1"), 210 kPa (30 psi) compressive strength, with ship-lapped edges and appropriate grooves for Type M.FUR.2 furring
- .7 Type INSUL.12D - Mineral fibre flexible insulation: see **Section 07 52 00**.
- .8 Type MFL/GV – metal flashing and coping, galvanized: see **Section 07 52 00**.
- .9 Type MEMB.21 – Modified bitumen one-ply vapour barrier or flashing membrane: see **Section 07 52 00**.
- .10 Type MEMB.26 – Modified bitumen two-ply exposed roofing membrane, granule surfaced: see **Section 07 52 00**.
- .11 Type REGL.1 – Reglet for inserted flashings, see **Section 07 52 00**.

## 2.6 Type FAST.2 – Fasteners for Exterior Stud System

- .1 Type FAST.2A – Screws: pan head, self-drilling, self-tapping sheet metal screws, corrosion protected to minimum requirements of CSSBI, with length 5 mm (0.2") longer than twice the thickness of steel.
- .2 Type FAST.2B – Anchors: concrete expansion anchors or other suitable drilled type fasteners.
- .3 Type FAST.2C – Bolts, nuts, washers: with Type GV.F.1 galvanized finish.
- .4 Type FAST.2D – Nails, screws and staples for gypsum sheathing: as per ASTM C954; flat head counter-sunk self tapping screws, length as required, with Type GV.F.1 galvanized finish.

## 3.0 EXECUTION

### 3.1 General

- .1 Do work in accordance with CSSBI 50M and CSA standards.
- .2 Coordinate with **Section 07 52 00** to install vapour barrier membrane under the steel stud tracks of the parapets.
- .3 Coordinate other work with Sections mentioned in **Related Work** above.

### 3.2 Installation of Parapets and Curbs

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- .1 Construct parapets and curbs as indicated on the drawings.
- .2 Ensure that the vapor barrier covers the slab or steel deck before installing steel stud tracks.
- .3 Erect system timber Type ST.STD.2/GV as detailed and secure it to the structure.
- .4 Install studs in the upper and lower tracks, and add girts as required to support the sheathing board.
- .5 Brace steel studs with horizontal girts as required.
- .6 Install vapor barrier in galvanized sheet steel type ST.PL/GV on side of the roof opening, if applicable.
- .7 Install insulation between the studs type INSUL.12D, taking care to fill all cavities.
- .8 Touch up welds with zinc-rich primer.
- .9 Install metal furring Type M.FUR.2.
- .10 Install rigid insulation Type INSUL.1/W between furring, then the sheathing board Type FCEM.BD.1 and secure with mechanical fasteners 200 mm ( 8 " ) apart on each stud and track at 12.7 mm (½ ") from borders and ends onto the metal furring.
- .11 Do not leave sheathing panels exposed to the weather.

### 3.3 Cleaning

- .1 Do cleaning as per Section 01 74 11.

**End of Section**

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**1.0 GENERAL**

- 1.1 Conditions
- 1.2 General Information
- 1.3 Related Work
- 1.4 References
- 1.5 Design Criteria
- 1.6 Submittals
- 1.7 Qualifications (P.Q.)
- 1.8 Waste Treatment

**2.0 PRODUCTS**

- 2.1 General
- 2.2 Materials and Accessories
- 2.3 Fasteners
- 2.4 Finishes
- 2.5 Fabrication – General
- 2.6 Cleaning and Shop Priming
- 2.7 Miscellaneous Custom Fabricated Assemblies
- 2.8 Miscellaneous Items

**3.0 EXECUTION**

- 3.1 General
- 3.2 Coordination
- 3.3 Preparation
- 3.4 Erection
- 3.5 Cleaning

1 - Issued for Tender (2015-05-20)

Prepared by: P.D.P.	Reviewed by: R.S.	Approved by: M.S.
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1.0 GENERAL

1.1 Conditions

- .1 Division 01 – General Requirements shall be read in conjunction with and shall govern Section.
- .2 **Acceptable materials or products:** When materials or products are prescribed by their trademark, consult **Instructions to Bidders** regarding the request for approval of materials or substitutes.

1.2 General Information

- .1 This Section covers all materials, equipment, tools & labour required for the supply and installation of metal fabrications
- .2 See **Section 05 05 00** for description of basic metal materials and finishes, and welding procedures.
- .3 Unless otherwise instructed, certain related products, specified elsewhere as indicated, are to be supplied and installed by this Section for the work of this Section.
- .4 Installation procedures described herein pertain to this or other Sections.
- .5 Unless otherwise indicated, and excluding stainless steel, galvanized steel, or aluminum work, all exposed metal work, unfinished, primed or not, must be painted – see **Section, 09 91 00** . Concealed metal work is to receive at minimum one coat of primer.
- .6 This Section is to be referred to by all Sections incorporating metal fabrications, concerning quality of fabrication and installation, unless otherwise indicated.

1.3 Related Work

- |    |                                    |                  |
|----|------------------------------------|------------------|
| .1 | Basic metal materials and finishes | Section 05 05 00 |
| .2 | Metal framing parapets             | Section 05 41 00 |
| .3 | Membrane roofing                   | Section 07 52 00 |
| .4 | Painting                           | Section 09 91 00 |
| .5 | Roof drains                        | Mechanical       |
| .6 | Mechanical equipment and conduits  | Mechanical       |
| .7 | Electrical elements                | Electrical       |
| .8 | Existing surfaces                  |                  |

1.4 References

- .1 Comply with all standards in this specification, unless more stringent requirements are given herein.
  - .2 See **Section 01 41 00** for legend of standards.
-

## 1.5 Design Criteria

- .1 Design stairs, balustrades and connections as per Quebec Building Code/NBC vertical and horizontal live loads requirements, taking into account at least a 4.8 kPa (100 lb/sq.ft) live load, in both vertical and horizontal directions; take corrective measures, if required.
- .2 Also observe requirements of the Construction Code of Quebec / NBC for railing or balustrades.
- .3 Detail and fabricate stairs and balustrades as per NAAMM Metal Stairs Manual, latest edition.

## 1.6 Submittals

- .1 Submit the documents and elements as per **Section 01 33 00**, taking also into consideration the following precisions:
  - .1 Shop drawings (S.D.):
    - .1 Submit shop drawings for all Custom Fabricated Assemblies.
    - .2 All issues of shop drawings for stairs, balustrades, landings, decks, platforms, catwalks, supporting elements or reinforcements for openings, and other supporting systems shall be signed and stamped by a professional engineer responsible for structural engineering calculations and technical studies, who is a member in good standing of the Ordre des ingénieurs du Québec, and shall include such calculations.

## 1.7 Qualifications (P.Q.)

- .1 Welders to be accredited by the Canadian Welding Bureau as per CSA W47.1 for steel work, and as per CSA W47.2 for aluminum work.
- .2 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.
- .3 Special items included in this Section shall be manufactured by specialized firms with at least **10 years** of experience in the field incorporating similar items.
- .4 Provide proof of accreditation.

## 1.8 Waste Treatment

- .1 Waste treatment to be done as per **Section 01 74 21**.

## 2.0 PRODUCTS

### 2.1 General

- .1 Materials shall be new, of the highest grade for purpose, clean and free from traces of machining, mill scale, flaking, rust, pitting, twists, kinks, buckles, defective edges and other defects impairing strength, durability and appearance. No material containing plugged or filled holes permitted.
-

- .2 Work shall be true to detail, clean, straight, with sharp profile and smooth finish surfaces.
- .3 Any name of an acceptable manufacturer, supplier or product model mentioned below is given only as a reference for a minimum level of quality.

## 2.2 Materials and accessories

- .1 Basic metal materials: see **Section 05 05 00**.
- .2 See **below** for other materials or products specified.

## 2.3 Fasteners

- .1 Type FAST.3 – Fasteners for metal work:
  - .1 Type FAST.3A – Bolts and anchor bolts, nuts and washers: as per ASTM A307; specific types as indicated on drawings. Among others, include the following where indicated:
  - .2 Type FAST.3B – High strength bolts: as per ASTM A325M or ASTM A325.
  - .3 Type FAST.3C – Anchoring devices: galvanized or stainless steel fasteners as per manufacturer's specifications; screws to be flat head.
  - .4 Type FAST.3D – Anchoring devices, patented: for attachment into concrete substrates, unless otherwise indicated.
  - .5 Type FAST.3E – Screws with hexagonal domed cap nuts: in steel, or stainless steel, as indicated, for 6.3 mm (¼") or 12.7 mm (½") diameter threaded rods.
  - .6 Type FAST.3F – Self-tapping screws: #10, with button-shaped head and with case, in stainless steel.
  - .7 Other fasteners: as indicated.
  - .8 All fasteners to be stainless steel for stainless steel work.
- .2 FAST.9 – Fasteners for aluminum work: aluminum alloy AA-6351, sleeves or other profiles, according to manufacturer's standards; grade 304 stainless steel and aluminum screws, anchors, etc., as required and recommended by the manufacturer. Fasteners to be concealed.

## 2.4 Finishes

- .1 Basic metal finishes: see **Section 05 05 00**.
- .2 Painting: see **Section 0 09 91 00**.

## 2.5 Fabrication – General

- .1 Fabricate work square, plumb, straight, accurate to required size, true to detail, clean with smooth finish surfaces, joints closely fitted and properly secured.
  - .2 Unless otherwise noted, fabricate items from steel with structural qualities to withstand strain and stresses to which the items will be normally subjected, as per CSA S16.1-01.
  - .3 Deburr, smooth and round off raw edges of plates and sheet material prior to forming during fabrication.
-

- .4 Unless otherwise directed, fit and assemble and shop weld elements, prior to site erection.
- .5 Assemble custom made items in the workshop, in sections as long and as complete as possible.
- .6 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated. Countersink exposed fastenings, cut off bolts flush with nuts.
- .7 Use hot dipped galvanized fasteners and anchors for galvanized items.
- .8 Use stainless steel fasteners and anchors for stainless steel and aluminum items.
- .9 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush, fill with metallic paste and sand to uniform smooth finish.

## 2.6 Cleaning and Shop Treatment

- .1 Clean surfaces in accordance with SSPC-SP2-63.
- .2 Ensure no fabrication oil remains on galvanized surfaces.
- .3 Ensure stainless steel items are properly cleaned, welding marks pickled.
- .4 Clean with "chlorothene" and apply shop coat primer, using primer Type PR.ST (the required variant), unadulterated, as prepared by manufacturer, unless otherwise indicated, to steel items except those in stainless steel or embedded in concrete. Apply primer on dry surfaces, free from rust, scale, and grease. Do not paint when temperature is lower than 7°C – See **Sections 05 05 00** and **09 91 00**.
- .5 Clean surfaces to be welded; prime and paint only after assembling and welding work are complete.
- .6 Apply two coats of primer, of different colours, at locations which will become inaccessible once the items are erected.
- .7 Galvanize all exterior steel items, unless otherwise indicated. Galvanize interior steel items as indicated. To avoid distortion, leave galvanized items to cool in air, do not immerse in water. Coordinate with the galvanizing firm for optimum sizes of items to be galvanized. Locate galvanization holes with the Departmental Representative approval.

## 2.7 Miscellaneous Custom Fabricated Assemblies

- .1 Fabricate the indicated assemblies in conformity with the **drawings**, complete with all supporting, bracing, anchoring or fastening elements, with materials indicated.

## 2.8 Miscellaneous Items

- .1 Fabricate miscellaneous angles, curbs, supports, duct supports, wall opening trims, bracings, sheets, flashings and other trims, furrings and closure plates, thresholds, bent plates, anchoring devices, other accessories, and welding materials, as shown on drawings, or as required by this or other Sections to complete this project.
-

### 3.0 EXECUTION

#### 3.1 General

- .1 Do work in accordance with CSSBI 50M and CSA standards.

#### 3.2 Coordination

- .1 Coordinate the installation of stairs and other elements with the **Structural Sections of Division 05**.
- .2 Coordinate with **Mechanical** et l'**Électricité** for all penetrations and other interferences.
- .3 Coordinate with all Sections concerned the fabrication of supporting elements for the products of these Sections.
- .4 Coordinate with Sections concerned for the supply and installation of supports for any item custom made or prefabricated.

#### 3.3 Preparation

- .1 Take accurate field measurements prior to preparation of shop drawings and fabrication.
- .2 Allow for trimming and fitting wherever taking field measurements.

#### 3.4 Erection

- .1 Erect metalwork as indicated, square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
  - .2 All welding must conform to CSA W47.1 and W47.2.
  - .3 Clean surfaces to be welded in place; prime and paint only after welding work complete.
  - .4 Assemble elements with precision, using welded connections wherever possible to provide rigidity. Weld on clean, dry, unpainted surfaces. Make joints tight, with flush faces. All exposed welds be cleanly ground, sanded and smoothed down to adjoining surfaces. Comply with CWB and AWS requirements.
  - .5 Make welds continuous for entire length of joint in stainless steel assemblies. Ensure welded joints are clean, without stains, and of the same appearance as the adjoining surfaces.
  - .6 Provide the proper anchor bolts, bolts and plates acceptable to Departmental Representative, and as per CSA S16.4 to anchor items to substrates or structure.
  - .7 Exposed fasteners must match finish and be compatible with elements attached.
-

- .8 Provide miscellaneous metal items required to properly build and secure the work of this or other Sections.
- .9 Do not weld or torch cut items in the field without the Departmental Representative's approval.
- .10 Install stairs and balustrades as detailed. Make welds continuous for entire length of joint. Rigidly secure assembly.
- .11 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .12 Provide adequate separation with bituminous paint or otherwise between incompatible materials to avoid electrolytic reaction.
- .13 Install manufactured items according to the manufacturers' instructions.
- .14 Make sure exposed raw edges of plates and sheet material are deburred, smoothed and rounded off prior to installation.
- .15 After completion of installation, touch up primed surfaces, rivets, bolts, burned or scratched surfaces and field welds with spot primer. Touch up galvanized surfaces with zinc-rich spot primer.
- .16 Solidly pack open spaces with non-shrink grout.
- .17 Seal joints around stainless steel or other items as indicate.
- .18 Remove fabrication lubricants from galvanized surfaces prior to installation.

### 3.5 **Cleaning**

- .1 Do cleaning as per **Section 01 74 11**.
- .2 Clean work areas of debris, traces of metals and welding materials.
- .3 Leave surfaces clean and free of grease and foreign matter.

**End of Section**

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