PART 1 – GENERAL

1.1 RELATED WORK

.1 Metal Deck: Section 053101

1.2 REFERENCES

.1 ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.

.2 ASTM A 325, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.3 CISC/CPMA 1-73a, A Quick-Drying, One-Coat Paint for Use on Structural Steel.

.4 CISC/CPMA 2-75, A Quick-Drying, Primer for Use on Structural Steel.

.5 CSA-G40.20, General Requirements for Rolled or Welded Structural Quality Steel.

.6 CSA-G40.21, Structural Quality Steel.

.7 CSA-S16, Consolidation: Limit States Design of Steel Structures.

.8 CSA-S136, Design of Cold Formed Steel Structural Members.

.9 CSA-W47.1, Certification of Companies for Fusion Welding of Steel.

.10 CSA-W48, Filler Metals and Allied Materials for Metal Arc Welding.

.11 CSA-W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.12 CSA-W59, Welded Steel Construction (Metal Arc Welding).

.13 ASTM A276, Standard Specification for Stainless Steel Forgings

1.3 SHOP DRAWINGS

.1 Submit erection drawings in accordance with Section 013300. Shop Detail Drawings for individual pieces and for standard connections are not to be submitted.

.2 Submit shop details of non-standard connections to be used in the connection of structural steel members. Identify on erection drawings the location of all non-standard connections.

.3 On erection drawings, indicate member size, base plate elevations, anchor bolt size, all details and information necessary for assembly and erection purposes.

.4 Ensure fabricator designed assemblies, components and connections, and drawings are stamped and signed by qualified professional engineer licensed in the Province of Construction.

1.4 DESIGN OF DETAILS AND CONNECTIONS

.1 Design details and connections in accordance with requirements of CSA-S16 and CSA-S136 to resist forces, moments, shears and allow for movements indicated.

.2 If connection for shear only (standard connection) is required:
- .1 Select framed beam shear connections from an industry-accepted publication such as "Handbook of the Canadian Institute of Steel Construction".
- .2 If shears are not indicated, select or design connections to support reaction resulting from maximum uniformly distributed load that can be safely supported by beam in bending, provided no concentrated loads act on beam. If concentrated loads act on beam, calculate loads or contact Departmental Representative for loads.

.3 For non-standard connections submit sketches stamped and signed by qualified professional engineer licensed in Province of construction.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Structural steel: to CSA-G40.21 Grade 350W.

.2 Hollow structural sections: to ASTM A500 Grade C.

.3 Channels, angles, plates and rod : Type 300W

.4 Anchor bolts: to CSA-G40.21, Grade 300W

.5 Bolts, nuts and washers: to ASTM A-325 and ASTM A-490

.6 Welding materials: to CSA-W48 and CSA-W59 and certified by Canadian Welding Bureau.

.7 Shop paint: to CISC/CPMA 1-73a and 2-75 as applicable.

.8 Stainless Steel: Type 304

2.2 FABRICATION

.1 Fabricate structural steel in accordance with CSA-S16, S136 and in accordance with reviewed shop drawings.

.2 Continuously seal members by continuous welds where indicated. Grind smooth.

.3 Provide holes for attachment of other work where required.

.4 Where finished surfaces of steel are to be left exposed to view, fabricate to AISC specifications for architecturally exposed steel including straightness. Remove mill marks, identification and surface imperfections.

.5 Exposed welds to be continuous for length of each joint. Grind exposed welds smooth and flush.

2.3 SHOP PAINTING

.1 For steel not to receive finish painting on site:
- .1 Clean all members of loose mill scale, rust, oil, dirt and other foreign matter, prepare and paint to CISC/CPMA 1-73. Red colour to be used.
- .2 Apply one coat of paint in shop to all steel surfaces except:
  Surfaces to be encased in concrete.
  Surfaces and edges to be field welded.

.2 For steel to receive finish painting on site:
- .1 Clean all members of loose mill scale, rust, oil, dirt and other foreign matter, prepare and prime to CISC/CPMA 2-75. Grey primer to be used
- .2 Apply one coat of primer in shop to all steel surfaces.

PART 3 - EXECUTION

3.1 GENERAL

.1 Structural steel work: in accordance with CSA-S16 and CSA-S136.

.2 Welding: in accordance with CSA-W59.

.3 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.

.4 Installation of "hump rods" on steel columns and angle framing to provide lateral support to masonry walls as detailed on structural drawings. Loose anchor bolts and miscellaneous steel for masonry support will be supplied by this section but installed by the masonry contractor and/or timber framer.

3.2 MARKING

.1 Mark materials in accordance with CSA-G40.20. Do not use die stamping.

3.3 ERECTION

.1 Erect structural steel, as indicated and in accordance with CSA-S16, CSA-S136 and in accordance with reviewed erection drawings.

.2 Field cutting or altering structural members: to approval of Departmental Representative.

.3 Clean with mechanical brush and touch up shop primer to bolts, welds and burned or scratched surfaces at completion of erection.

.4 Continuously seal members by continuous welds where indicated. Grind smooth.

.5 Assume full responsibility for the integrity of structure during erection. Make necessary provision for all erection loads and for sufficient temporary bracing to maintain safe structure, plumb and in true alignment until completion of erection and installation of necessary permanent bracing.

.6 Set column base plates and loose bearing plates with steel shims to proper elevation, true and level, ready for grouting-in.

.7 Use purpose-made stainless steel anchors when attaching/connecting stainless steel components.

3.4 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.

.2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Structural Steel: Section 051223

1.2 REFERENCES

.1 CSA-S136, Design of Cold Formed Steel Structural Members.

.2 CSA-W47.1, Certification of Companies for Fusion Welding of Steel.

.3 CSA-W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.4 CSA-W59, Welded Steel Construction (Metal Arc Welding).

.5 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.

.6 ASTM A 653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.7 CSSBI 10M, Standard for Steel Roof Deck.

.8 CSSBI 12M, Standard for Composite Steel Deck.

.9 CAN/CGSB-1.181, Ready Mixed Organic Zinc-Rich Coating

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 013300.

.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in province of construction.

.3 Indicate details of temporary shoring of steel deck, such as location, time and duration of placement and removal of shoring for concrete fill decks.

.4 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

1.4 DESIGN REQUIREMENTS

.1 Design steel deck using limit states design in accordance with CSA S136 and, CSSBI 10M and CSSBI 12M.

.2 Steel deck and connections to steel framing to carry Dead, Live and other Loads including Lateral Loads, diaphragm action, composite deck action, and uplift as indicated.

.3 Deflection under specified Live Load not to exceed 1/240 of span, except that when plaster gypsum board ceilings are hung directly from deck, Live Load deflection not to exceed 1/360 of span.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Zinc (Z) coated steel sheet: to ASTM-A653 structural quality, passivated. Refer to drawings for minimum base steel thickness. Minimum zinc coating shall be Z275.

.2 Closures: in accordance with manufacturer's recommendations.

.3 Cover plates, cell closures and flashings: In accordance with manufactures recommendations; Steel sheet with minimum base steel thickness to match deck material. Metallic coating same as deck material.

.4 Types of Decking

.1 Steel roof deck: Refer to drawings for minimum base steel thickness and depth of profile. Deck shall be non-cellular with interlocking side laps.

2.2 FABRICATION

.1 Include in work of this section cover plates, cell closures, fasteners, stiffeners and accessories as required. Fabricate sheet metal accessories of same material and finish as deck.

.2 Fabricate to meet specified requirements of CSA-S136 and to support superimposed loading as shown on Structural Drawings.

.3 Form deck units to provide male and female interlocking side lap joints.

.4 Fabricate units to provide for joints between abutting panel ends with 50 mm overlap, sized to provide smooth joint. End laps to occur over supports only.

.5 Span deck units over at least three or more supports wherever possible. Increase thickness of metal to compensate for continuity wherever fewer than three supports may occur.

.6 Incorporate reinforcing stiffeners for unsupported edges of metal deck.

PART 3 – EXECUTION

3.1 GENERAL

.1 Structural steel work: in accordance with CSA-S136 and CSSBI 10M and CSSBI 12M.

.2 Welding: in accordance with CSA-W59, except where specified otherwise.

.3 Companies to be certified under Division 1 or 2.1 of CSA-W47.1 for fusion welding of steel and/or CSA-W55.3 for resistance welding.

3.2 ERECTION

.1 Erect steel deck as indicated and in accordance with CSA-S136, CSSBI 10M and CSSBI 12M and in accordance with reviewed erection drawings.

.2 Butt ends: to 3 mm gap. Install steel cover plates over gaps wider than 3 mm.

.3 Lap ends: to 50 mm minimum.

.4 Fasten deck to structural steel as indicated on structural drawings. Fasten sheets of deck to adjacent sheets of deck as indicated on structural drawings and as per deck manufacturer's specifications.

3.3 OPENINGS AND AREAS OF CONCENTRATED LOADS

.1 No reinforcement is required for openings cut in deck which are smaller than 150 mm square.

.2 For deck openings with any one dimension greater than 150 mm and for areas of concentrated load, reinforce in accordance with structural framing details indicated on structural drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 03 30 00 - Cast-in-Place Concrete.

.4 Section 04 05 19 - Masonry Anchorage and Reinforcing.

.5 Section 04 05 10 - Common Work Results for Masonry.

.6 Section 05 12 23 - Structural Steel.

.7 Section 05 31 00 - Steel Deck.

.8 Section 09 91 23 - Interior Painting.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

- .1 ASTM A53/A53M-12, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.
- .2 ASTM A269-15a, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .3 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian Standards Association (CSA International)

- .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164-2003, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .4 CSA W59-13,Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.3 The Environmental Choice Program

- .1 CCD-047a, Paints, Surface Coatings.
- .2 CCD-048, Surface Coatings - Recycled Water-borne.

1.3 SUBMITTALS

.1 Product Data:

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.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:

.1 For finishes, coatings, primers and paints.

.2 Shop Drawings;

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 QUALITY ASSURANCE

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 01 14 10 – Scheduling and Management of Work.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Storage and Protection:

.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal, paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.

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Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21.

.2 Bolts and anchor bolts: to ASTM A307.

.3 Overhead door track guard replacement profile. 1200 mm high, 300 mm channel. See Doors and Frames Schedule on drawings for details.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Where possible, fit and shop assemble work, ready for erection.

.3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164.

.2 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

.3 Epoxy paint coating.

2.4 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.5 CHANNEL FRAMES

.1 Fabricate frames as required or repair existing frames to suit new personnel door installation. from steel ___, sizes of channel and opening as indicated.

.2 Weld channels together to form continuous frame for jambs and head of openings, sizes as indicated.

.3 Finish: galvanized.

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Part 3 Execution

3.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 CHANNEL FRAMES

.1 Install steel channel frames to openings as indicated.

3.3 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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