

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16, Limit States Design of Steel Structures.
 - .4 CAN/CSA-S136, Cold Formed Steel Structural Members.
 - .5 CSA-S136.1, Commentary on CSA Standard S136.
 - .6 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .7 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding of Structural Steel.
 - .8 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
 - .9 CSA W59, Welded Steel Construction (Metal Arc Welding) Metric.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-85.10, Protective Coatings for Metals.
- .3 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A36/A36M, Specification for Structural Steel.
 - .2 ASTM A325M, Specification for High-Strength Bolts for Structural Steel Joints Metric.
- .4 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA).
 - .1 CISC/CPMA 1, Quick-Drying, One Coat Paint for Use on Structural Steel.
 - .2 CISC/CPMA 2, Quick-Drying, Primer for use on Structural Steel.
- .5 The Society for Protective Coatings (SSPC)
 - .1 SSPC SP 1, Solvent Cleaning.
 - .2 SSPC SP 7, Brush-Off Blast Cleaning.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings including fabrication and erection documents and materials list.
- .2 On erection drawings: indicate details and information necessary for assembly and erection purposes such as, description of methods, sequence of erection, type of equipment used in erection and temporary bracings. Show detail of all non-standard connections such as bracing connections, truss connections, moment connections and hanger assemblies and

other non-standard connections as requested by the Departmental Representative's Representative.

- .3 Erection drawings to be stamped by a qualified professional Engineer licensed to practice in the Province of Newfoundland and Labrador. The erection drawings are to contain a clause stating that the professional Engineer who stamped the erection drawings is responsible for all fabricator designed assemblies, components and connections required for this project.
- .4 Drawings for all fabricator designed assemblies, components and connections are to be stamped and signed by the professional Engineer who stamped the erection drawings.

1.3 SAMPLES

- .1 Prepare sample of typical exposed structural connections in accordance with approval of Departmental Representative's Representative. Samples to be judged upon alignment of surfaces, uniform contact between surfaces, smoothness and uniformity of finished welds. When approved, sample units will serve as a standard for workmanship, appearance and material acceptable for entire project.

1.4 DESIGN REQUIREMENTS

- .1 Design details and connections in accordance with requirements of CAN/CSA-S16 and CAN/CSA-S136 with CSA-S136.1 to resist forces, moments, shears and allow for movements indicated.
- .2 Unless noted otherwise on the drawings or in the specifications connection design is the responsibility of the structural steel fabricator. Fully detailed connections shown on the contract drawings including bolt and welded sizes are deemed to have been designed by the Departmental Representative's Representative.
- .3 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 from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam.
- .4 For non-standard connections, submit sketches and design calculations stamped and signed by qualified professional Engineer licensed in the Province of Newfoundland and Labrador.

1.5 SOURCE QUALITY CONTROL

- .1 If requested submit on certified copy of mill reports covering chemical and physical properties of steel used in this work.

1.6 QUALITY ASSURANCE

- .1 At least 2 weeks prior to fabrication of structural steel submit to Departmental Representative's Representative a letter from the fabricators Welding engineer stating the Welding engineer is responsible for welding procedures and practices for this project as outlined in CSA S47.1
- .2 Provide certificate of Quality Compliance from steel fabricator upon completion of structural steel fabrication stating that the work has been designed and fabricated in accordance with the requirements of the contract documents.
- .3 If requested, submit to the Departmental Representative's Representative one copy of all approved welding procedures for this project.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Structural steel: to CAN/CSA-G40.20/G40.21 Grade as indicated, 300W and/or CAN/CSA-S136.
- .2 Cold formed structural members: to CAN/CSA S-136.
- .3 Anchor bolts: to CAN/CSA-G40.20/G40.21, Grade 300W.
- .4 Bolts, nuts and washers: to ASTM A325M
- .5 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .6 Shop paint primer:
 - .1 To CISC/CPMA 1 for interior steel.
 - .2 To CISC/CPMA 2 for exterior steel.
- .7 Hot dip galvanizing: galvanize steel for exterior steel to CAN/CSA-G164, minimum zinc coating of 600 g/m².

2.2 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with approved reviewed shop drawings.
- .2 Install shear studs in accordance with CSA W59.
- .3 Continuously seal members by continuous welds where indicated.
- .4 Provide holes in top bottom flanges for attachment of wood nailers.

2.3 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 except where members to be encased in concrete.
- .2 Clean members, remove loose mill scale, rust, oil, dirt and other foreign matter. Prepare surface by solvent cleaning to SSPC SP 1, followed by brush-off blast cleaning to SSPC SP 7.
- .3 Apply one coat of primer in shop to steel surfaces except:
 - .1 Surfaces to be encased in concrete.
 - .2 Surfaces to receive field installed stud shear connections.
 - .3 Surfaces and edges to be field welded.
 - .4 Faying surfaces of friction-type connections.
 - .5 Below grade surfaces in contact with soil.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5° C.
- .5 Maintain dry condition and 5°C minimum temperature until paint is thoroughly dry.
- .6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S16.
- .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.

3.2 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative's Representative for direction before commencing fabrication.

3.3 MARKING

- .1 Mark materials in accordance with CAN/CSA G40.20/G40.21. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.4 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with approved reviewed erection drawings.
- .2 Field cutting or altering structural members: to approval of Departmental Representative's Representative.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.5 FIELD PAINTING

- .1 Paint in accordance with Section 09 91 00 – Painting.
 - .1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC SP 7 except as specified otherwise. Apply in accordance with CAN/CGSB 85.10.

3.6 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by an Inspection and Testing company designated by Departmental Representative's Representative.
- .2 The Inspection and Testing Company will carry out vertical and horizontal alignment checks, torque testing and inspection of representative connection welds.
- .3 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative's Representative.
- .4 Submit test reports to Departmental Representative's Representative within 2 weeks of completion of inspection.
- .5 Departmental Representative will pay costs of inspection and testing. Costs for any reinspection and/or re-testing as a result of deficient work will be paid for by the contractor, by credit change order
- .6 Prior to inspection & testing by the Inspection and Testing company the structural steel erection contractor will carry out an inspection of the work and make the inspection results available to the Departmental Representative's Representative and the Inspection and Testing company. The inspection report will identify the areas of work inspected, deficiencies identified and measures taken to correct the deficiencies.
- .7 Test shear studs in accordance with CSA W59.
- .8 Copies of test reports and inspections to be included in Commissioning Manual

END

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-S16, Design of Steel Structures.
 - .3 CSA-S136, North American Specification for the Design of Cold Formed Steel Structural Members.
 - .4 CSA-W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .5 CSA-W55.3, Certification of Companies for Resistance Welding of Steel and Aluminum.
 - .6 CSA-W59, Welded Steel Construction (Metal Arc Welding) Metric.
- .2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)
 - .1 CISC/CPMA 1, Quick-Drying, One-Coat Paint for Use on Structural Steel.
 - .2 CISC/CPMA 2, Quick-Drying, Primer for Use on Structural Steel.
- .3 Canadian General Standards Board (CGSB).
 - .1 CAM/CGSB-85.10, Protective Coatings for Metals.
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual.

1.2 SHOP DRAWINGS

- .1 Submit shop details and erection drawings.
- .2 Submit drawings stamped and signed by qualified professional Engineer registered or licensed in province of Newfoundland and Labrador, Canada.
- .3 On erection drawings include relevant details such as joist mark, depth, spacing, bridging lines, bearing, anchorage and details.
- .4 In shop details, provide particulars, relative to joist geometry, framed openings, splicing details, bearing and anchorage. Include member size, properties, specified and factored member loads, and stresses under various loadings, deflection and camber.
- .5 If requested submit to Departmental Representative one copy of all approved welding procedures for this project.

1.3 DESIGN OF STEEL JOISTS AND BRIDGING

- .1 Design steel joists and bridging to carry loads indicated in joist schedule shown on drawings in accordance with CAN/CSA-S16.
- .2 Design joists and anchorages for uplift forces as indicated.
- .3 Ensure joists are manufactured to consider load effects due to fabrication, erection and handling.
- .4 Unless indicated otherwise on the drawings limit roof joist deflection due to specified live load to L/300 of span and deflection due to specified total load to L/240 of span.
- .5 Unless indicated otherwise on the drawings limit floor joist deflection due to specified live load to L/300 of span and deflection due to specified total load to L/240 of span.
- .6 Submit calculations and joist design drawings for all joists for Departmental Representative review at least 2 weeks prior to fabrication. Calculations and joist design drawings to be stamped and signed by a Professional Engineer licensed to practice in the Province of Newfoundland and Labrador.

1.4 QUALITY ASSURANCE

- .1 At least two weeks prior to start of fabrication submit to the Departmental Representative a letter from the fabricators welding engineer stating that the welding engineer is responsible for welding procedures and practices for this project as outlined in CSA W 47.1.
- .2 Provide Certificate of Quality Compliance from open web steel joists fabricator upon completion of fabrication stating that the work has been designed and fabricated in accordance with the requirements of the contract documents.

PART 2- PRODUCTS

2.1 MATERIALS

- .1 Open web steel joists: to CAN/CSA-S16.
- .2 Structural steel: to CSA-G40.20/G40.21 and CSA-S136.
- .3 Welding materials: to CSA-W59 with CSA-W59S1.
- .4 Shop paint primer: to CISC/CPMA-2.
- .5 Shear studs: to CSA-W59, Appendix H with CSA-W59S1.

2.2 FABRICATION

- .1 Fabricate steel joists and accessories as indicated in accordance with CAN/CSA-S16 and in accordance with approved reviewed shop drawings.
- .2 Weld in accordance with CSA-W59.
- .3 Provide top bottom chord extensions where indicated.
- .4 Provide diagonal and horizontal bridgings and anchorages as indicated.
- .5 Weld studs to top bottom chords for attachment purposes.
- .6 Install shear studs in accordance with CSA-W59.

2.3 SHOP PAINTING

- .1 Clean, prepare and shop prime surfaces of steel joists to CAN/CSA-S16.
- .2 Clean all members of loose mill scale, rust, oil, dirt and other foreign matter. Prepare surfaces in accordance with SSPC SP1 and SP7.
- .3 Apply one coat of primer to steel surfaces except:
 - .1 Surfaces to be encased in concrete.
 - .2 Surfaces to receive field installed stud shear connectors and steel decks.
 - .3 Surfaces and edges to be field welded.
 - .4 Faying surfaces of friction-type connections.
 - .5 Below grade surfaces in contact with soil.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.
- .5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.
- .6 Strip paint bolts, nuts, sharp edges and corners before prime coat is dry.

PART 3- EXECUTION

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S16.
- .2 Welding: in accordance with CSA-W59.
- .3 Ensure installers are certified to CSA-W47.1 for fusion welding and/or CSA-W55.3 for resistance welding.

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- .4 Provide certification that welded joints are qualified by Canadian Welding Bureau.

3.2 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work; report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.

3.3 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.
- .2 Testing laboratory will inspect representative joists for integrity, accuracy of fabrication and soundness of welds. Testing laboratory will also monitor test loading of joists used by manufacturer to verify design and check representative field connections. Departmental Representative will determine extent of and identify all inspections.
- .3 Submit test report to Departmental Representative within 7 days after completion of inspection.
- .4 Departmental Representative will pay costs of tests. Costs for any re-inspections and or retesting as a result of deficient work paid for by contractor by credit change order.
- .5 Test shear studs in accordance with CSA-W59.
- .6 Copies of inspections and test reports to be included in Commissioning Manual.
- .7 Prior to inspection and testing by the Inspection and testing company the structural steel erection contractor will carry out an inspection of the work and make the inspection results available to the Departmental Representative and the inspection and testing company. The inspection report will identify the areas of work inspected, deficiencies identified and measures taken to correct the deficiencies.

3.4 ERECTION

- .1 Erect steel joists and bridging as indicated in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.
- .2 Complete installation of all bridging and anchorages before placing construction loads on joists.
- .3 Do not alter or field cut joints or bridging without approval of Departmental Representative.
- .4 Clean with mechanical brush and touch up shop primer to bolts, welds, burned or scratched surfaces at completion of erection.

3.5 FIELD PAINTING

- .1 Paint: in accordance with Section 09 91 00 - Painting.
- .2 Touch up all damaged surfaces and surfaces without shop coat with CISC/CPMA-2 in accordance with manufacturers' recommendations to CAN/CGSB-85.10.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by steel joists framing installation.

END

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA C22.2 No.79, Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
 - .2 CAN/CSA-S16, Design of Steel Structures.
 - .3 CSA-S136, North American Specification for the Design of Cold Formed Steel Structural Members.
 - .4 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .5 CSA W55.3, Certification for Companies for Resistance Welding of Steel and Aluminum.
 - .6 CSA W59, Welded Steel Construction, (Metal Arc Welding) Metric.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
- .3 American Society for Testing and Materials, (ASTM)
 - .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI 10M, Standard for Steel Roof Deck.
 - .2 CSSBI 12M, Standard for Composite Steel Deck.

1.2 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 gypsum board ceilings are hung directly from deck, live load deflection not to exceed 1/360 of span.
- .4 Where vibration effects are to be controlled as indicated, dynamic characteristics of decking system to be designed to be in accordance with CAN/CSA-S16.

1.3 SHOP DRAWINGS

- .1 Submit drawings stamped and signed by qualified professional Engineer registered or licensed in the Province of Newfoundland and Labrador, Canada.

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- .2 Submit design calculations if requested by Departmental Representative's Representative.
 - .3 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A653/A653M structural quality Grade 230, 255, with ZF75 coating, for interior surfaces not exposed to weather, minimum base steel thickness as indicated on the drawings.
- .2 Decks to be painted: zinc-iron alloy coated decks suitable for finish painting.
- .3 Acoustic insulation: fibrous glass 17.5 kg/m³ density profiled to suit deck flutes.
- .4 Closures: as indicated in accordance with manufacturer's recommendations.
- .5 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness of 0.76 mm. Metallic coating same as deck material.
- .6 Primer: zinc rich, ready mix to CAN/CGSB-1.181.
- .7 Caulking: to Section 07 92 00 – Joint Sealants.
- .8 Painting: to Section 09 91 23 – Interior Painting.
- .9 Shear studs: to CSA W59.

2.2 TYPES OF DECKING

- .1 Steel roof deck: non-cellular , interlocking side laps. Base steel thickness, depth & profile as shown on the drawings.
- .2 Acoustic steel roof deck: non-cellular, perforated on vertical face of flutes, interlocking side lap, base steel thickness, depth & profile as shown on the drawings. Flat sheet for cellular deck, 0.76 mm minimum base steel thickness.
- .3 Composite steel floor deck: non-cellular, upright embossed fluted profile, interlocking side lap, base steel thickness, depth & profile as shown on the drawings. Flat sheet for cellular deck, 0.76 mm minimum base steel thickness.
- .4 Cellular roof deck for electrical raceway: to CSA C22.2No.79.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/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 approved reviewed erection drawings.
- .2 For cellular deck butt ends: to 1.5 to 3 mm gap. Install steel cover plates over gaps wider than 3 mm.
- .3 For non-cellular deck lap ends to 50 mm minimum.
- .4 Weld and test stud shear connectors through steel deck to steel joists/beams below in accordance with CSA W59.
- .5 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.
- .6 Prior to concrete placement, steel deck to be free of soil, debris, standing water, loose mil scale and other foreign matter.
- .7 Temporary shoring, if required, to be designed to support construction loads, wet concrete and other construction equipment. Do not remove temporary shoring until concrete attains 75% of its specified 28 day compression strength.
- .8 Place and support reinforcing steel as indicated.

3.3 CLOSURES

- .1 Install closures in accordance with approved details.

3.4 OPENINGS AND AREAS OF CONCENTRATED LOADS

- .1 No reinforcement required for openings cut in deck which are smaller than 150 mm square.
- .2 Frame deck openings with any one dimension between 150 to 300 mm as recommended by manufacturer, except as otherwise indicated.

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- .3 For deck openings with any one dimension greater than 300 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

3.5 CONNECTIONS

- .1 Install connections in accordance with CSSBI recommendations as indicated on the drawings whichever is the most stringent.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by steel decking installation.

END

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A53/A53M-12, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .4 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

- .2 Canadian Standards Association (CSA):
 - .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-14, Consolidation (R2007) Limit states design of steel structures
 - .5 CSA W48-14, Carbon Steel Covered Electrodes for Shielded Metal Arc Welding.
 - .7 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

- .3 Master Painters Institute (MPI):
 - .1 MPI #18, Primer, Zinc Rich, Organic
 - .2 MPI #79, Primer, Alkyd, Anti-Corrosive for Metals

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, including installation instructions, MSDS sheets, specifications and data sheets in accordance with Section 01 33 00 Submittal Procedures.

 - .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.
 - .3 For all components/assemblies that are load bearing supporting structures, and/or lateral loads, shop drawing to be signed and stamped by an Engineer registered to practice in Newfoundland and Labrador.
 - .4 Stainless Steel Wall Protection Components:
 - .1 Show coordination elevation drawings of wall panel locations in adjacency to wall equipment and plastic laminate wall materials.
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- .3 Samples:
 - .1 Submit (2) two sections of each type of wall protection and wall base, illustrating component's design, configuration, colour, and finish.

1.3 PROTECTION

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 Common Product Requirements.
- .2 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
- .3 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CSA-G40.20/G40.21, Grade 300W.
- .2 Steel pipe: to ASTM A53/A53M extra strong, black finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchorbolts: to ASTM A307.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
 - .2 Use self-tapping shake-proof round headed screws on items requiring assembly by screws or as indicated.
 - .3 Where possible, fit and shop assemble work, ready for erection.
 - .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
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2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
- .2 Shop coat primer: to MPI standards.
- .3 Zinc primer: zinc rich, ready mix to MPI standards.
- .4 Bituminous paint: to MPI standards.
- .5 Stainless Steel: Type 304

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 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7°C.
- .3 Clean surfaces to be field welded; do not paint.

2.6 MISCELLANEOUS METAL SCHEDULE

- .1 Shelf Angle Lintels:
 - .1 Steel angles: hot dipped galvanized (exterior) prime painted (interior), sizes as indicated on the documents. Install unequal leg angles with long leg vertical.
 - .2 Extend 200 mm beyond side of the opening.
 - .3 Finish: refer to Section 09 91 00.
 - .4 For all openings over 1800mm shop drawing of supports to be stamped and signed by an Engineer.
 - .2 Washroom Lavatory Supports:
 - .1 Refer to support details and sizes and materials noted on Drawing A-401.
 - .2 Supports must be capable of supporting 226 kg download.
 - .3 All components welded in shop and transported to site.
 - .4 Prime painted, shop finished.
 - .5 All materials / methods must be confirmed in shop drawings, stamped and signed by an Engineer.
 - .3 Bollards:
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- .1 Steel pipe Schedule 40, 100 mm diameter structural section.
 - .2 Extend bollard 1220 mm below surface of grade and 1525 mm above finish grade. Fill with concrete with rounded cap.
 - .3 Prime and paint finish and ensure all blemishes and welds are ground smooth prior to finishing, colour yellow; refer to Section 09 91 00 Painting.
 - .4 Refer to documents for location.
- .4 Windbreak:
- .1 Refer to windbreak details, sizes and materials shown on Drawing A-109.
 - .2 All materials, including framing, glazing and method attachment must be confirmed in shop drawings, stamped and signed by an Engineer.
 - .3 All structural components to be hot-dipped galvanized.
 - .4 Shop fabricated, and transported to site.
- .5 Head Support for Security Grille at Servery at toilet compartments full height.
- .1 Refer to head support detail on Drawing A-115.
 - .2 Allow for deflection in detailing of support.
 - .3 Shop assemble and shop prime painted, ready for transport.
 - .4 All materials and methods must be confirmed in shop drawings, stamped and signed by an Engineer.
- .6 Head Support for full height glazing in security interior vestibule (Departure & Arrival areas):
- .1 Refer to head support detail on Drawing A-115.
 - .2 Allow for deflection in detailing of support.
 - .3 Shop assemble and shop prime painted, ready for transport.
 - .4 All materials and methods must be confirmed in shop drawings, stamped and signed by an Engineer.
- .7 Stainless Steel Wall Corner Guard (**CG**):
- .1 72" x 1.5" x 1.5"; 90 degree bullnose
 - .2 14 ga (.083") Type 304 Stainless Steel
 - .3 Satin #4 finish
 - .4 Knurl edges and corners smooth and free of burs.
 - .5 To resist lateral impact force of 45kg (100lbs) at any point without damage or permanent set
 - .6 Install from top of wall base.
 - .7 Locations as indicated on drawings.
- .8 Stainless Steel Wall End Guard (**EG**):
- .1 Width as required for wall thickness at instance of installation location. Min. 1.5" Returns.
 - .2 14 ga (.083") Type 304 Stainless Steel
 - .3 Satin #4 finish
 - .4 Knurl edges and corners smooth and free of burs.
 - .5 To resist lateral impact force of 45kg (100lbs) at any point without damage or permanent set
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- .6 Install from top of wall base full height to finished ceiling.
 - .1 In instances of installation at a wall specified to be tiled, embed in tile field. Abut tiles to end guard. Do not apply over tile. Coordinate with tile installer.
 - .2 In instance where installation is adjacent to millwork components (e.g. at ticket counters), coordinate with millwork installer.
- .7 Locations as indicated on drawings.
- .9 Stainless Steel Sheet Wall Protection:
 - .1 Dimension as required where indicated. Coordinate with plastic laminate wall panel material for layout. Provide shop drawing elevations for approval of final dimensions.
 - .2 14 ga (.083") Type 304 Stainless Steel Sheet
 - .3 Satin #4 finish
 - .4 Knurl edges and corners smooth and free of burs.
 - .5 To resist lateral impact force of 45kg (100lbs) at any point without damage or permanent set
 - .6 Install from top of wall base full height to finished ceiling.
 - .1 In instances of installation at a wall specified to be tiled, embed in tile field. Abut tiles to end guard. Do not apply over tile. Coordinate with tile installer.
 - .2 In instance where installation is adjacent to millwork components (e.g. at ticket counters), coordinate with millwork installer.
 - .7 Locations as indicated on drawings.
- .10 Stainless Steel Wall Base:
 - .1 72" x 1.5" x 1.5"; 90 degree bullnose
 - .2 14 ga (.083") Type 304 Stainless Steel
 - .3 Satin #4 finish
 - .4 Knurl edges and corners smooth and free of burs.
 - .5 Complete with cove bend
 - .6 Height 4 3/4" or as required in instances of recessed installation.
 - .7 Locations as indicated on drawings.

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.
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- .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 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 SHELF ANGLE LINTEL

- .1 Refer to Masonry Procedures & Structural Drawings for installation of shelf lintels.

3.4 STEEL MASONRY SUPPORTS

- .1 Refer to Masonry Procedures and Structure for support fastening details.

END
