1 GENERAL

1.01 REFERENCE STANDARDS

.1 ASTM International Inc.
- .1 ASTM A 36/A 36M, Standard Specification for Carbon Structural Steel.
- .2 ASTM A 193/A 193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
- .3 ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A 325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .5 ASTM A 325M, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.
- .6 ASTM A 490M, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.

.2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
- .1 Handbook of the Canadian Institute of Steel Construction.
- .2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.

.3 CSA Group (CSA)
- .1 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, North American Specifications for the Design of Cold Formed Steel Structural Members.
- .5 CSA W47.1, Certification of Companies for Fusion Welding of Steel.
- .6 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.
- .7 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .8 CSA W59, Welded Steel Construction (Metal Arc Welding).

.4 Master Painters Institute
- .1 MPI-INT 5.1, Structural Steel and Metal Fabrications.
- .2 MPI-EXT 5.1, Structural Steel and Metal Fabrications.

.5 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International
- .1 NACE No. 3/SSPC SP-6, Commercial Blast Cleaning.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan, Canada.

.3 Erection drawings:
- .1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:
  - .1 Description of methods.
  - .2 Sequence of erection.
  - .3 Type of equipment used in erection.
  - .4 Temporary bracings.

.4 Fabrication drawings:
- .1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Saskatchewan, Canada.

.5 Samples:
- .1 Prepare sample of typical exposed structural connections in accordance with AISC Specifications of Architecturally exposed structural steel for approval of Departmental 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.

.6 Source Quality Control Submittals:
- .1 Submit electronic copies of mill test reports 4 weeks prior to fabrication of structural steel.
  - .1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.
  - .2 Provide mill test reports certified by metallurgists qualified to practice in Province of Saskatchewan, Canada.

.7 Fabricator Reports:
- .1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.03 DELIVERY, STORAGE AND HANDLING

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

.2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

2 PRODUCTS

2.01 DESIGN REQUIREMENTS

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

.2 Shear connections:
- .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.
- .2 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, when shears are not indicated.

.3 For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.

.4 Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Saskatchewan, Canada for non-standard connections.

2.02 MATERIALS

.1 Structural steel: to CSA-G40.20/G40.21.

.2 Anchor bolts: to CSA-G40.20/G40.21, Grade 300W or as indicated on the drawings.

.3 High strength anchor bolts: to ASTM A 193/A 193M.

.4 Bolts, nuts and washers: to ASTM A 307.

.5 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.

.6 Shop paint primer: to CISC/CPMA 2-75 solvent reducible alkyd, red oxide.

.7 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m².

.8 Shear studs: to CSA W59, Appendix H.

2.03 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with approved shop drawings.

.2 Install shear studs in accordance with CSA W59.

.3 Continuously seal members by continuous welds.

.4 Provide holes in top and bottom flanges for attachment of wood nailers where required.

2.04 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC-SP-6.

.3 Apply one coat of primer in shop to steel surfaces to achieve minimum dry film thickness of 75 mils, 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 slip-critical 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 from bolts, nuts, sharp edges and corners before prime coat is dry.

3 EXECUTION

3.01 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.02 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.

3.03 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.

3.04 MARKING

.1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When 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.

3.05 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with approved 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, rivets, welds and burned or scratched surfaces at completion of erection.

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

3.06 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.

.3 Submit test reports to Departmental Representative within 4 weeks of completion of inspection.

.4 Test shear studs in accordance with CSA W59.

3.07 FIELD PAINTING

.1 Paint in accordance with Section 09 91 23 - Interior Painting.

.1 Touch up damaged surfaces and surfaces without shop coat with primer to NACE No.3/SSPC-SP-6 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

3.08 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A 780-01 Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings.
- .3 ASTM A 792/A 792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian Sheet Steel Building Institute (CSSBI)
- .1 CSSBI 10M, Standard for Steel Roof Deck.
- .2 CSSBI 12M, Standard for Composite Steel Deck.

.3 CSA Group
- .1 CSA C22.2 No.79-2016, Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
- .2 CSA S16, Design of Steel Structures.
- .3 CSA S136, North American Specification for the Design of Cold Formed Steel Structural Members including Update No. 1 (2014), Update No. 2. (2014), Update No. 3 (2015).
- .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) including Update No. 1 (2014), Update No. 3 (2015), Update No. 4 (2015).

1.02 DESIGN REQUIREMENTS

.1 Design steel deck to CSA S136 and CSSBI 10M.

.2 Design roof and floor composite steel deck to CSA S16, CSA S136, and CSSBI 12M.

.3 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.

.4 Deflection under specified live load maximum 1/240 of span, except when gypsum board ceilings hung directly from deck, live load deflection maximum 1/360 of span.

.5 Where vibration effects controlled as indicated, dynamic characteristics of decking system designed in accordance with CSA S16.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for steel decking and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS Health and Safety Requirements.

.3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan, Canada.
- .2 Submit design calculations if requested by Departmental Representative.
- .3 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.
- .4 Indicate details of temporary shoring of steel deck, such as location, time and duration of placement and removal of shoring for concrete fill decks.

1.04 QUALITY ASSURANCE

.1 Retain professional engineer registered or licensed in Saskatchewan, Canada, with experience in steel deck Work of comparable complexity and scope, to perform following services as part of Work of this Section:
- .1 Structural design of steel deck and composite deck.
- .2 Review, stamp, and sign Shop Drawings, design calculations, and revisions required.
- .3 Conduct on-site inspections and prepare and submit inspection reports verifying this part of Work in accordance with Contract Documents and reviewed Shop Drawings. Perform inspections minimum of once per month.
- .4 Monitor supplier's and fabricator's quality control tests and reports.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect decking from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section

.5 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Waste Management and Disposal.

2 PRODUCTS

2.01 MATERIALS

.1 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A 653/A 653M structural quality Grade 230, with ZF75 coating, for interior surfaces not exposed to weather, painted finish.

.2 Decks to be painted: zinc-iron alloy coated decks suitable for finish painting.

.3 Zinc (Z) coated steel sheet: to ASTM A 653/A 653M structural quality Grade 230, with ZF75, coating, regular spangle surface.

.4 Aluminum-zinc alloy (AZ) coated steel sheet: to ASTM A 792/A 792M structural quality grade 230, with AZ 150 coating, surface.

.5 Acoustic insulation: fibrous glass 17.5 kg/m³ density minimum profiled to suit deck flutes.

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

.7 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness of 0.76 mm minimum. Metallic coating same as deck material.

.8 Primer: to section 09 91 23 - Interior Painting.
.1 VOC limit 250 g/L maximum to GS-11.

.9 Caulking: to Section 07 92 00 - Joint Sealants.

.10 Shear studs: to CSA W59.

2.02 TYPES OF DECKING

.1 Steel deck: as indicated on drawings with interlocking side laps.

.2 Acoustic steel deck: as indicated on drawings, perforated on vertical face of flutes, interlocking side laps.

.3 Composite steel deck: as indicated on drawings, embossed fluted profile, interlocking side laps.

.4 Cellular deck for electrical raceway: to CSA C22.2 No. 79.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for steel decking installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation after unacceptable conditions remedied and after receipt of written approval to proceed from Departmental Representative.

3.02 PREPARATION

.1 Locate bundles of deck materials to prevent overloading of supporting members.

.2 Install temporary shoring before placing deck panels, if required to meet deflection limitations.

3.03 ERECTION

.1 Structural steel work: in accordance with CSA S136.

.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 or CSA W55.3 for resistance welding.

.4 Erect steel deck as indicated and in accordance with CSA S136 and in accordance with reviewed erection drawings.

.5 Butt ends: to 1.5 to 3 mm gap. Install steel cover plates over gaps minimum 3 mm wide.

.6 Lap ends: to 50 mm minimum.

.7 Weld and test stud shear connectors through steel deck to steel joists/beams below in accordance with CSA W59.

.8 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.

.9 Prior to concrete placement, steel deck free of soil, debris, standing water, loose mil scale and other foreign matter.

.10 Temporary shoring, if required, 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.

.11 Place and support reinforcing steel as indicated.

.12 Closures: Install closures in accordance with approved details.

.13 Openings and Areas of Concentrated Loads
- .1 No reinforcement required for openings cut in deck maximum 150 mm square.
- .2 Frame deck openings with dimension between 150 to 300 mm as recommended by manufacturer, except as otherwise indicated.
- .3 For deck openings with dimension minimum 200 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

.14 Connections: Install connections in accordance with CSSBI recommendations as indicated.

3.04 FIELD TOUCH-UP PAINTING

.1 Upon erection completion, mechanically brush clean bolts, rivets, welds, and burned or scratched surfaces.

.2 For galvanized steel surface with damage and without shop coat, repair with field touch up primer.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.06 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by steel decking installation.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM A 123/A 123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM A 792/A 792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 CSA Group
- .1 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .2 CSA W55.3, Certification of Companies for Resistance Welding of Steel and Aluminum.
- .3 CSA W59, Welded Steel Construction (Metal Arc Welding).
- .4 CAN/CSA S136 Package, North American Specification for the Design of Cold Formed Steel Structural Members.

.3 Canadian Sheet Steel Building Institute (CSSBI)
- .1 CSSBI 51, Lightweight Steel Framing Design Manual.
- .2 CSSBI Fact Sheet #3, Care and Maintenance of Prefinished Sheet Steel Building Products.
- .3 CSSBI Technical Bulletin Vol. 7, No. 2, Changing Standard Thicknesses for Canadian Lightweight Steel Framing Applications.
- .4 CSSBI S5, Guide Specification for Wind Bearing Steel Studs.

.4 Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - current edition.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for metal studs and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan, Canada.
- .2 Indicate design loads, member sizes, materials, design thickness exclusive of coatings, coating specifications, connection and bracing details, screw sizes and spacing, and anchors.

.3 Indicate locations, dimensions, openings and requirements of related work.
.4 Indicate welds by welding symbols as defined in CSA W59.

1.03 QUALITY ASSURANCE

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

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

.3 Manufacturer Reports: Submit manufacturer's written report, within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.04 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect structural metal studs from nicks, scratches, and blemishes.
.3 Protect steel studs during transportation, site storage and installation in accordance with CSSBI Sheet Steel Facts #3.
.4 Handle and protect galvanized materials from damage to zinc coating.
.5 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section.

.5 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 MATERIALS

.1 Steel: to CAN/CSA S136, fabricated from ASTM A 653/A 653M, Grade as indicated on drawings.

.2 Zinc coated steel sheet: quality to ASTM A 653/A 653M, with Z180 designation coating.

.3 Aluminum-zinc alloy coated steel sheet: quality to ASTM A 792/A 792M, with AZM150 designation coating.

.4 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.

.5 Screws: pan head, self-drilling, self-tapping sheet metal screws, corrosion protected with minimum zinc coating thickness of 0.008 mm.

.6 Anchors: concrete expansion anchors or other suitable drilled type fasteners.

.7 Bolts, nuts, washers: hot dipped galvanized to ASTM A 123/A 123M, 380 g/m² zinc coating.

.8 Touch up primer: zinc rich, to MPI #18.

2.02 STEEL STUD DESIGNATIONS

.1 Colour code: to CSSBI Technical Bulletin Vol.7, No. 2.

2.03 METAL FRAMING

.1 Steel studs: to CAN/CSA S136, fabricated from metallic coated steel, depth as indicated.

.2 Stud tracks: fabricated from same material and finish as steel studs, depth to suit.
- .1 Bottom track: single piece.
- .2 Top track: single piece.

.3 Bridging: fabricated from same material and finish as studs, 38 x 12 x 1.09 mm minimum thickness.

.4 Angle clips: fabricated from same material and finish as studs, 38 x 38 mm x depth of steel stud, 1.37 mm minimum thickness.

.5 Tension straps and accessories: as recommended by manufacturer.

2.04 SOURCE QUALITY CONTROL

.1 Mill reports for material properties reviewed by Departmental Representative.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts acceptable for structural metal stud in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate.
- .2 Inform Consultant of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions remedied and

after receipt of written approval to proceed from Consultant.

3.02 GENERAL

.1 Weld in accordance with CSA W59.

.2 Certification of companies: to CSA W47.1 for fusion welding.

.3 Do structural metal stud framing work to CSSBI S5.

3.03 ERECTION

.1 Erect components to requirements of reviewed shop drawings.

.2 Anchor tracks securely to structure at 800 mm on center maximum, unless lesser spacing prescribed on shop drawings.

.3 Erect studs plumb, aligned and securely attached with 2 screws minimum.

.4 Seat studs into bottom tracks and single piece top track.

.5 Install 50 mm minimum telescoping track at top of walls where required to accommodate vertical deflection.
- .1 Nest top track into deflection channel minimum of 30 mm and maximum of 40 mm.
- .2 Do not fasten tracks together.
- .3 Stagger joints.

.6 Install studs at maximum 50 mm from abutting walls, openings, and each side of corners and terminations with dissimilar materials.

.7 Brace steel studs with horizontal internal bridging at 1200 mm maximum.
- .1 Fasten bridging to steel clips fastened to steel studs with screws or by welding.

.8 Frame openings in stud walls to adequately carry loads by use of additional framing members and bracing as detailed on shop drawings.

.9 Touch up welds with coat of zinc rich primer.

.10 Erection Tolerances
- .1 Plumb: maximum 1/500th of member length.
- .2 Camber: maximum 1/1000th of member length.
- .3 Spacing: maximum +/- 3 mm from design spacing.
- .4 Gap between end of stud and track web: maximum 4 mm.

.11 Cutouts
- .1 Maximum size of cutouts for services as follows:

Member Depth	Across Member Depth	Along Member Length	Centre to Centre Spacing (mm)
92	40 max.	105 max.	600 min.

102	40 max.	105 max.	600 min.
152	65 max.	115 max.	600 min.

.2 Limit distance from centerline of last unreinforced cutout to end of member maximum 300 mm.

3.04 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:
- .1 Obtain written report from manufacturer's verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - QUALITY ASSURANCE.
- .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits to review Work as follows.
  - .1 After delivery and storage of products, and when preparatory Work complete but before installation begins.
  - .2 Twice during progress of Work at 25% and 60% complete.
  - .3 Upon completion of Work, after cleaning carried out.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.06 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by structural metal stud installation.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM A 53/A 53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 ASTM A 269M-15a, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .3 ASTM A 307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA Group
- .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CSA S16-14, Design of Steel Structures.
- .4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding) Metric.

.3 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - current edition.

.4 ULC Standards
- .1 UL 2768-2011, Architectural Surface Coatings.
- .2 UL 2760-2011, Surface Coatings - Recycled Water-borne.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for sections plates pipe tubing bolts and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Saskatchewan, Canada.
- .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.03 QUALITY ASSURANCE

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

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.04 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 MATERIALS

.1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W 350W.

.2 Steel pipe: to ASTM A 53/A 53M standard weight extra strong double extra strong, black galvanized finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A 307.

.6 Stainless steel tubing: to ASTM A 269, Type 302 commercial grade seamless welded with AISI No. 4 finish.

.7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.02 FABRICATION

.1 Refer to Drawings for required metal fabrications.

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

.3 Use self-tapping shake-proof flat round oval headed screws on items requiring assembly by screws or as indicated.

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

.5 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.03 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.

.2 Shop coat primer: MPI- INT EXT 5.1A MPI- INT EXT 5.1B in accordance with chemical component limits and restrictions requirements and VOC limits of UL 2768 UL 2760 GS-11.

.3 Zinc primer: zinc rich, ready mix to MPI-INT EXT 5.2C in accordance with chemical component limits and restrictions requirements and VOC limits of CCD-047a CCD-048 GS-11.

2.04 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.

2.05 SHOP PAINTING

.1 Primer: VOC limit 250 g/L maximum to GS-11 UL 2768 UL 2760.

.2 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

.3 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Paint when temperature minimum 7 degrees C.

.4 Clean surfaces to be field welded; do not paint.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions remedied and after receipt of written approval to proceed from Departmental Representative.

3.02 ERECTION - GENERAL

.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 DCC Representative Consultant 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 Supply components for work by other trades in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA S16 orWeld field connection.

.7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
.1 Primer: maximum VOC limit 250 g/L to GS-11.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
.1 Primer: maximum VOC limit 250 g/L to GS-11.

3.03 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.04 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION