Part 1 General

1.1 REFERENCES

.1 ASTM International Inc.

.1 ASTM A325, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.2 ASTM A325M, Specification for High-Strength Bolts for Structural Steel Joints Metric.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)

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

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

.4 Canadian Standards Association (CSA International)

.1 CSA G40.20/G40.21-04, 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 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.

.4 CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.

.5 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.

.6 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.

.7 CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.8 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.5 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International

.1 SSPC SP-2, SP-7.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.7 Shop Drawings:

.1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

.8 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.

.9 Fabrication drawings:

.1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Manitoba, Canada.

.10 Samples:

.1 Upon request, prepare sample of typical exposed structural connections in accordance with AISC Specifications of Architecturally exposed structural steel for approval of Contract Administrator. 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.

.11 Source Quality Control Submittals:

.1 Submit 2 copies of mill test reports 4 weeks prior to fabrication of structural steel.

.2 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.

.12 Provide mill test reports certified by metallurgists qualified to practice in Province of Manitoba, Canada.

.13 Fabricator Reports:

.1 Upon request, provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.3 QUALITY ASSURANCE

.1 If requested, submit certified copies of mill reports showing chemical and physical properties of steel used in this Work.

.2 Work of this Section shall be done by a structural steel fabricator/erector who is fully accredited and a current member in good standing of Canada Institute of Steel Construction, or who has submitted a list of experience reference acceptable to the Contract Administrator at least one week prior to tender closing. Failure to meet this requirement may result in disqualification of fabricator/erector.

.3 Welding shall be done by a fabricator fully certified to the conditions of CSA Qualification Code W55.3 or W47.1 respectively. Conform to CAN/CSA-S16 where requirements are at variance.

.4 Advise the Contract Administrator of proposed fabrication schedule, at least ten working days prior to starting, to permit the Testing Agency to arrange for inspection of Work in

the shop.

1.4 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 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 Shear connections:

.3 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.

.4 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.

.5 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.

.6 Upon request, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Manitoba, Canada for non standard connections.

2.2 MATERIALS

.1 Structural steel: All rolled or steel structural sections shall be G40.21-350W. All Hollow structural sections to be G40.21-350W class C. All angles, channels and plates shall be G40.21-300W.

.2 Anchor bolts: to CSA-G40.20/G40.21, Grade 300W.

.3 Bolts, nuts and washers: to ASTM A307, ASTM A325M, and ASTM A490/A490M as required.

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

.5 Shop paint primer:

.6 Steel not receiving finish painting: one coat of CISC/CPMA 1-73A quick drying shop primer

.7 Steel receiving finish painting: one coat of CISC/CPMA 2-75 quick drying shop primer.

.8 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m^2.

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

2.3 FABRICATION

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

.2 Install shear studs in accordance with CSA W59.

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

2.4 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel as follows:

.1 Steel not receiving finish painting: One coat of CISC / CPMA 1-73a quick drying shop primer. Steel to be cleaned in conformance with SSPC-SP2.

.2 Steel receiving finish painting: One coat of CISC / CPMA 2-75 quick drying shop primer. Steel to be cleaned in conformance with SSPC-SP7.

.3 Exterior structural steel: All exposed exterior structural steel shall be hot-dipped galvanized unless noted.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter.

.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 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.

Part 3 Execution

3.1 GENERAL

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

.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 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.

3.3 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to the Contract Administrator.

3.4 ERECTION

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

.2 Provide necessary erection equipment, bracing, shoring and temporary flooring as required for erection and for all safety regulations. Brace and support structure during erection to ensure that it is maintained in alignment under construction and other loading and until all other construction elements contributing to stability are in place.

.3 Check anchor bolt and insert layout before erection. Arrange for correction of discrepancies.

.4 Set base plates on cleaned bearing surfaces. Solidly pack open spaces between shims with bedding mortar consisting of non-shrink grout as specified in Section 03 30 00.

.5 Obtain permission of the Contract Administrator prior to field cutting or altering of structural members not shown on Drawings.

.6 Clean field welds, bolted connections and abraded areas. Apply touch up shop primer (or zinc rich paint for galvanized steel) to bolts, welds and burned or scratched surfaces at completion of erection.

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

3.5 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by the Contract Administrator.

.2 The Inspection and Testing Company will carry out vertical and horizontal alignment checks, torque testing and inspection of bolted and welded connections for a minimum 10% representative sample of connections. Welding inspections to be visual, except where non-destructive testing is deemed necessary by the Testing Agency or The Contract Administrator.

.3 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by the Contract Administrator.

.4 Submit test reports to Contract Administrator within 2 weeks of completion of inspection.

.5 Test shear studs in accordance with CSA W59.

3.6 DEFECTIVE WORK

.1 Remove and replace, or repair, damaged or defective work, at no cost to the Contract Administrator.

.2 Contractor shall be responsible for the cost of additional testing and re-inspection made necessary by the occurrence of deficient Work.

.3 Submit in writing details of proposed method of remedial work, for approval by the Contract Administrator. Details to be signed and sealed by a licensed Professional Engineer retained by the Contractor.

.4 Correction of misaligned holes or other field modifications by flame-cutting is not permissible.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 31 00 - Steel Deck

.2 Section 05 12 23 – Structural Steel for Buildings

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)

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

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

.3 Canadian Standards Association (CSA International)

.1 CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-S16-01, Limit States Design of Steel Structures.

.3 CSA-S136-94(R2001), Cold Formed Steel Structural Members.

.4 CSA-W47.1-92(R2001), Certification of Companies for Fusion Welding of Steel Structures.

.5 CSA-W55.3-1965(R1998), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.6 CSA-W59-03, Welded Steel Construction (Metal Arc Welding).

1.3 QUALITY ASSURANCE

.1 Upon request submit two copies of mill test reports at least four weeks prior to fabrication of steel joists and accessories. Reports to show:

.1 Chemical and physical properties.

.2 Other details of steel to be incorporated into work.

.3 Certification by qualified metallurgists confirming that tests conform to requirements of CSA G40.20/G40.21

.2 Supply affidavit prepared by fabricator of structural steel joists stating that materials and products used in fabrication conform to this specification.

1.4 DESIGN OF STEEL JOISTS AND BRIDGING

.1 Design steel joists and bridging to carry loads indicated in joist schedule shown on drawings and in accordance with CAN/CSA-S16, unless otherwise noted on drawings.

.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 Limit roof/floor joist deflection due to specified live load to L/240 for roofs.

.5 Provide top and bottom chord bridging with cross-bridging in-between joists and end bays as per CAN/CSA S16.

1.5 SHOP DRAWINGS

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

.2 Submit drawings stamped and signed by qualified professional engineer licensed in province of Manitoba, Canada.

.3 Indicate on erection drawings, relevant details such as joist mark, depth, spacing, bridging lines, bearing, anchorage and details.

.4 Provide particulars, on shop drawings, 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.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Structural steel: to CSA-G40.20/G40.21 and CSA-S136.

.2 Welding materials: to CSA-W59

.3 Shop paint primer:

.1 Steel not receiving finish painting: one coat of CISC/CPMA 1-73A quick drying shop primer

.4 Shear studs: to CSA-W59, Appendix H.

2.2 FABRICATION

.1 Fabricate steel joists and accessories as indicated in accordance with CAN/CSA-S16.1, CSA-S136, and in accordance with reviewed shop drawings.

.2 Weld in accordance with CSA-W59.

.3 Provide top and bottom chord extensions where indicated.

.4 Provide diagonal and horizontal bridging's and anchorages as required.

.5 Weld studs to top chords for attachment purposes.

.6 Install shear studs in accordance with CSA-W59.

Part 3 Execution

3.1 GENERAL

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

.2 Welding: in accordance with CSA-W59 and with CSA-W59S1.

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

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

3.2 ERECTION

.1 Erect steel joists and bridging as indicated in accordance with CAN/CSA-S16.1, CSA-S136, and in accordance with reviewed erection drawings.

.2 Complete installation of all bridging and anchorages before placing construction loads on joists.

.3 Field cutting or altering joists or bridging that are not shown on shop drawings: to approval of Contract Administrator.

.4 Clean and touch up shop primer to bolts, welds, burned or scratched surfaces at completion of erection.

3.3 SHOP PAINTING

.1 Clean, prepare and shop prime surfaces of steel joists to CAN/CSA-S16.

.2 Clean members of loose mill scale, rust, oil, dirt and other foreign matter. Prepare surfaces in accordance with SSPC SP1 brush blast.

.3 Apply one coat of CISC/CPMA 1 primer to steel surfaces to achieve maximum dry film thickness of 0.65 mm to 0.80 mm except:

.1 Surfaces to be encased in concrete.

.2 Surfaces and edges to be field welded.

.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 on bolts, nuts, sharp edges and corners before prime coat is dry.

3.4 FIELD PAINTING

.1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP7 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

- .1 ASTM A653/A653M-01a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A792/A792M-01a, Specification for Steel Sheet, 55%Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

- .1 CSA C22.2 No.79-1978(R1999), Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
- .2 CAN/CSA-S16.1-94(R2000), Limit States Design of Steel Structures.
- .3 CSA-S136-94(R2001), Cold Formed Steel Structural Members.
- .4 CSA W47.1-92(R2001), Certification of Companies for Fusion Welding of Steel Structures.
- .5 CSA W55.3-1965(R1998), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .6 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.4 Canadian Sheet Steel Building Institute (CSSBI)

- .1 CSSBI 10M-96, Standard for Steel Roof Deck.

1.2 SHOP DRAWINGS AND INFORMATIONAL SUBMITTALS

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

.2 Submit drawings stamped and signed by qualified Professional Engineer registered and licensed in the Province of Manitoba.

.3 Submit design calculations if requested by The Contract Administrator.

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

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

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials for disposal to recycling facilities.

1.4 QUALITY ASSURANCE

.1 Steel deck manufacturers: members in good standing of the Canadian Sheet Steel Building Institute.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Design steel deck using limit states design in accordance with CSA S136.

.2 Steel decking and all connectors/fasteners shall be designed to safely carry dead, live and diaphragm loads as indicated, including any variable or concentrated loads, wind uplift and construction loads.

.3 Deflection under live loads (including construction loads) shall not exceed:

.1 Roof Deck: 1/240th of span, except when plaster or gypsum board ceilings are suspended directly from deck, live load deflection not to exceed 1/360th of span.

2.2 MATERIALS

.1 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A653/A653M structural quality Grade 230, with ZF75 coating, for interior surfaces not exposed to weather, unpainted finish, thickness as indicated on structural drawings.

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

.3 Zinc (Z) coated steel sheet: to ASTM A653/A653M structural quality Grade 230, with ZF75, coating, for exterior surfaces exposed to weather, thickness as indicated on structural drawings.

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

.5 Closures: as indicated in accordance with manufacturer's recommendations.

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

.7 Primer: zinc rich, ready mix to CAN/CGSB-1.181.

.8 Shear studs: to CSA W59.

2.3 TYPES OF DECKING

.1 Steel roof deck: steel thickness and deck depth as indicated on the drawings, non-cellular, interlocking side laps.

Part 3 Execution

3.1 GENERAL

.1 Structural steel work: in accordance with CAN/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 and/or CSA W55.3 for resistance welding.

3.2 ERECTION

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

.2 Butt ends: to 1.5 to 3 mm gap. Install steel cover plates over gaps wider than 3 mm.

.3 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 Temporary shoring, if required, to be designed to support construction loads and other construction equipment.

.7 Place and support reinforcing steel as indicated.

3.3 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 with minimum L64x64x6.4 each side of opening perpendicular to flutes. Angle shall be welded to at least two flutes on each side of opening.

.3 Deck supplier shall reinforce openings over 300mm to 450mm across the flutes with suitable reinforcement based on a structural analysis of the loads involved.

.4 For deck openings with any one dimension greater than 450 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

3.4 CONNECTIONS

.1 Provide connections in accordance with CSSBI recommendations as indicated.

3.5 DEFECTIVE WORK

.1 Remove and replace, or repair, damaged or defective work, at no cost to the Contract.

.2 Submit in writing, details of proposed method of remedial work, for approval by the Contract Administrator. Details to be signed and sealed by a licensed Professional Engineer retained by the Contractor.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Wind/suction and axial load bearing formed steels stud for exterior wall assembly framing. Framing to include wall z-bar girts as detailed on Drawings for both masonry and exterior steel stud walls.

.2 Roof loading requirements for design of roof z-bar purlins.

.3 Components described in this Section to be designed by a registered professional engineer, licensed to practice in Manitoba.

1.2 RELATED SECTIONS

.1 Section 05 12 23 - Structural Steel for Buildings

.2 Section 06 10 13 - Wood Blocking and Curbing

.3 Section 07 44 56 – Mineral Fibre Reinforced Cementitous Panels

.4 Section 07 26 00 - Vapour Retarders

.5 Sectoin 07 61 00 – Sheet Metal Roofing & Wall Panels

.6 Section 07 62 00 - Sheet Metal Flashing and Trim

.7 Section 09 21 16 - Gypsum Board Assemblies

1.3 REFERENCES

.1 AWS D1.3/D1.3M-2008 - Structural Welding Code – Sheet Steel.

.2 ASTM A307-07b - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.3 ASTM A325M-09 - Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.

.4 ASTM A653/A653M-09 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM A792/A792M-09a - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.6 ASTM C954-07 - Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.

.7 ASTM C955-09a - Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.

.8 CAN/CGSB-1.181-99 - Ready-Mixed, Organic Zinc-Rich Coating.

.9 CAN/CGSB-7.1-98 - Lightweight Steel Wall Framing Components.

.10 CAN/CSA-S16-09 - Design of Steel Structures.

.11 CAN/CSA-S136-07 - North American Specification for the Design of Cold-Formed Steel Structural Members.

.12 CAN/ULC-S101-07 - Standard Methods of Fire Endurance Tests of Building Construction Materials.

.13 CSA-A370-04 - Connectors for Masonry.

.14 CSA-A371-04 - Masonry Construction for Buildings.

.15 CSA-S304.1-04 - Masonry Design for Buildings (Limit States Design).

.16 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel Structures.

.17 CSA-W55.3-08 - Certification of Companies for Resistance Welding of Steel and Aluminum.

.18 CSA-W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding).

.19 CSSBI (Canadian Sheet Steel Building Institute - 51-06 - Lightweight Steel Framing Design Manual, 2nd Edition.

.20 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

.21 The Master Painters Institute (MPI) / Architectural Painting Specification Manual - February 2004

.1 MPI # 18, Organic Zinc Rich Primer.

1.4 PERFORMANCE REQUIREMENTS

.1 Maximum Allowable Deflection: 1:600 of span.

.2 Exterior Wall Assemblies:

.1 Design to CSSBI 51, National Building code, CSA-S136.

.2 Design to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.

.3 Design assembly to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

.4 Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with code applicable at place of the Work.

.5 Design stud system supporting masonry veneer to requirements of CSA-S304.1 with veneer deflections limited to L/600.

.3 Exterior Metal Roof Assemblies:

.1 Snow loads and snow build-up and rain load, expected in this geographical region NBCC climatic data, 50 year probability.

.2 Wind loads, positive and negative, expected in this geographical region NBCC climatic data, 50 year probability.

.3 Dead load of roof system.

.4 If the roof system is to be designed as a shear diaphragm, then the factored shear design loads “Q” and the flexibility factors “F” must be shown on the structural drawings.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Coordinate with other work having a direct bearing on work of this section.

1.6 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations and gauge thickness.

1.7 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures. All shop drawings to include Engineer's seal of a Professional Engineer licensed to practice in Manitoba.

1.8 CLOSEOUT SUBMITTALS

.1 Section 01 78 00: Submission procedures.

1.9 QUALITY ASSURANCE

.1 Products of This Section: Manufactured to ISO 9000 certification requirements.

.2 Calculate structural properties of framing members to CSSBI 51, CSA-W47.1, CSA-W55.3, CSA-W59 requirements.

.3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

.4 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

.5 Design structural elements under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.

.6 Form, fabricate, install, and connect components to CSSBI 51 - Lightweight Steel Framing Design Manual.

Part 2 Products

2.1 FRAMING MATERIALS

.1 Framing Materials: Cold-rolled steel conforming to CSA-S136, Grade as specified on Structural Drawings, with metallic coating to ASTM A653/A653M, minimum coating thickness Z180 (G60), unless located outside the exterior membrane, then Z275 (G90).

.1 Studs: CAN/CGSB-7.1, ASTM C955, formed to channel shape, punched web, knurled faces.

.2 Track: Formed steel; channel shaped; same width as studs, tight fit; solid web.

.3 Z-Bar wall girts and roof purlins: galvanized metal z-bars to be designed to support load imposed by wall cladding system & roof system as detailed on Drawings.

2.2 ACCESSORIES

.1 Bracing, Furring, Bridging: Formed sheet steel, thickness determined by performance requirements specified.

.2 Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.

.3 Welding Materials: CSA-W59.

.4 Touch-Up Primer for Galvanized Surfaces: CAN/CGSB-1.181, zinc rich.

2.3 FASTENERS

.1 Bolts, Nuts and Washers: ASTM A307, ASTM A325M, hot-dip galvanized to minimum requirements of CSSBI.

.2 Self-drilling, Self-tapping Screws: Steel, hot dip galvanized to minimum requirements of CSSBI.

.3 Anchorage Devices: Powder actuated, drilled expansion bolts or screws with sleeves; hot-dip galvanized to minimum requirements of CSSBI.

2.4 FABRICATION

.1 Fabricate assemblies of formed sections to sizes and profiles required.

.2 Provide cut-outs centred in webs of members to accommodate services and though-the knockout style bridging.

.3 Fit, reinforce, and brace framing members to suit design requirements.

.4 Fit and assemble in largest practical sections for delivery to site, ready for installation.

.5 Do welding to CSA-S136, CSA-W59 and AWS D1.3, as applicable.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that building components are ready to receive work.

.2 Verify that rough-in utilities are in proper location.

3.2 ERECTION OF STUD WORK

.1 Install components to manufacturer's written instructions.

.2 Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 600 mm (24 inches) on centre. Coordinate installation of acoustic sealant with floor and ceiling tracks.

.3 Place studs 400 mm (16 inches) on centre unless noted otherwise on Drawings; not more than 50 mm (2 inches) from abutting walls and at each side of openings. Connect studs to tracks using fastener method.

.4 Construct corners using minimum three studs. Double stud wall openings, door jambs, and window jambs.

.5 Erect load bearing studs one piece full length. Splicing of studs is not permitted.

.6 Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.

.7 Coordinate placement of insulation in multiple stud spaces after erection.

.8 Install intermediate studs above and below openings to align with wall stud spacing.

.9 Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing. Refer to Drawings for deflection head details.

.10 Attach solid wood blocking to studs for attachment of fixtures anchored to walls.

.11 Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

.12 Touch-up field welds and damaged galvanized surfaces with primer.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

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

.3 Section 04 05 00 - Common Work Results for Masonry.

.4 Section 05 12 23 - Structural Steel.

.5 Section 05 31 00 - Steel Deck.

.6 Section 10 28 14 – Toilet & Bath Accessories

1.2 REFERENCES

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

.1 ASTM A53/A53M-[02], Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A269-[02], Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.3 ASTM A307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16.1-[01], Limit States Design of Steel Structures.

.4 CSA W48-[01], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.4 The Environmental Choice Program

.1 CCD-047a-[98], Paints, Surface Coatings.

.2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

1.3 SUBMITTALS

.1 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 61 00 - Common Product Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 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 00 – Cleaing and Waste Processing.

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

.3 Collect and separate for disposal all appropriate materials for recycling in accordance with Waste Management Plan.

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

Part 2 Products

2.1 MATERIALS

.1 Steel sections: to G40.21, Grade 350W.

.2 Angles, Channels and Plates: to G40.21, Grade 300W.

.3 Steel Tubing: to G40.21-350W CLASS C or ASTM A500, Grade C.

.4 Welding materials: to CSA W59.

.5 Bolts and anchor bolts: to ASTM A307. Galvanized to ASTM A153 for galvanized components.

.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 flat 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.

.5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

.6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FINISHES

.1 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

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

.3 Shop coat primer: to CAN/CGSB-1.40.

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

2.4 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 degrees C.

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

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 Contract Administrator 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 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.

3.3 PROTECTION

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

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

3.4 SCHEDULES

.1 The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

.2 Roof Access Ladder

.1 Supply galvanized steel access ladder as detailed on Drawings. Ladder to be designed by a licensed professional engineer in Manitoba.

.3 Steel Angle Lintels

.1 Supply steel angles for openings in masonry walls, prime painted. Provide minimum 200mm (8 inches) bearing at ends of openings. Refer to Structural Drawings.

.2 Weld or bolt back to back angles to profiles indicated.

.4 Steel Bollards:

.1 Supply galvanized steel bollards as detailed on Drawings.

.5 Overhead Door Metal Jamb & Head Plates:

.1 Supply galvanized steel plates, anchored to concrete block walls as detailed on Drawings.

.6 Wood Trellis Joist Connection Plates:

.1 Supply galvanized steel connection plates for wood trellis joists as detailed on Drawings. Refer also to Structural Drawings.

.7 Apron Slab Bearing Angles:

.1 Supply galvanized steel angles to support exterior concrete apron slabs

.8 Stainless Steel Mirrors:

.1 Refer to Section 10 28 14 and Drawings for sizes.

.9 Exterior Building Signage:

.1 Refer to Section 10 14 00 and Drawings.

END OF SECTION