Part 1 General

1.1 REFERENCES

.1 ASTM International Inc.

- .1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
- .2 ASTM A193/A193M-08, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
- .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A325-07a, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .5 ASTM A325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
- .6 ASTM A490M-04ae, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, 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 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.

.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 Master Painters Institute

- .1 MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
- .2 MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.

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

.1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

1.2 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:

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

1.3 SHOP DRAWINGS:

.1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 – Submittal Procedures.

.2 Erection drawings: indicate 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 bracing.

.3 Ensure Fabricator drawings showing design assemblies, components and connections are stamped and signed by a qualified, professional Consultant, licensed in the Province of Manitoba, Canada.

1.4 SAMPLES:

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

.2 Prepare sample of typical exposed structural connections in accordance withAISC Specifications of Architecturally exposed structural steel for approval of Consultant. 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.

1.5 QUALITY ASSURANCE:

.1 Submit 2 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 the project.

.2 Provide mill test reports certified by metallurgist qualified to practice in the Province of Manitoba, Canada.

.2 Provide structural steel Fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and product standards specified and indicated.

1.6 LEED REQUIREMENTS

.1 See Section 01 35 21 - LEED Requirements.

.2 LEED Submittals: Submit LEED supporting documentation in accordance with Section 01 35 21 - LEED Requirements.

.3 Waste Management and Disposal: Dispose of packaging and waste materials in appropriate on-site bins for recycling and disposal in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Recycled Content: Supply building materials with recycled materials (post consumer plus ½ post-industrial content) in accordance with LEED Materials and Resources Credits MR 4.1 & 4.2 – Recycled Content.

.5 Regional Materials: Supply building materials that are regionally extracted, harvested, or recovered within 800km of the project location when shipped by truck, or within 2400km of the project location when shipped by rail, in accordance with LEED Materials and Resources Credit MR 5.1 & 5.2 – Regional Materials.

.6 Indoor Environmental Quality Credit EQ 4 – Low - Emitting Materials.

.1 LEED Indoor Environmental Quality Credit EQ 4.1 – Low-Emitting Materials: Adhesives and Sealants.

.1 Low VOC complying with SCAQMD Rule #1168, Latest edition.

.2 LEED Indoor Environmental Quality Credit EQ 4.2 – Low-Emitting Materials: Paints and Coatings.

.1 Architectural paints, coatings and primers applied to interior walls and ceilings to Green Seal Standard GS-11, latest edition.

.2 Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates to Green Seal Standard GS-03, latest edition.

.3 Clear wood finishes, floor coatings, stains and shellacs applied to interior elements to SCAQMD Rule 1113, latest edition.

Part 2 Products

2.1 NOTE:

.1 See the Structural Drawings for further information.

.2 In any situation where the specifications do not agree with the Structural Drawings or the Geotechnical report:

.1 The Structural Drawings and the Geotechnical report shall govern,

.2 The Consultant must be alerted, who will then confirm the requirements.

2.2 MATERIALS

.1 Structural steel: as indicated in drawings.

.1 Recycled Content: Steel to contain ≥ 35% recycled material. (Post consumer plus ½ post-industrial content.)

.2 Regional Materials: Steel to meet LEED Regional Materials requirements.

.2 Anchor bolts: as indicated in drawings.

.3 Bolts, nuts and washers: as indicated on drawings.

.4 Welding materials: as indicated in drawings.

.5 Shop paint primer: as indicated in drawings and in accordance with Section 09 91 23 – Painting.

.1 Low VOC as per LEED requirements.

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

.7 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 as indicated or required.

2.4 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 CAN/CSA-S136 and Section 09 91 23 – Painting.

.1 Low VOC as per LEED requirements.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to SSPC-SP-6.

.3 Apply one coat of primer in shop to steel surfaces to achieve minimum dry film thickness of .065 mm to .80 mm 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 Structural steel work: in accordance with CAN/CSA-S16 CAN/CSA-S136.

.2 Welding: in accordance with CSA W59.

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

3.2 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Contract Administrator for direction before commencing fabrication.

3.3 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.

3.4 ERECTION

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

.2 Field cutting or altering structural members: to approval of Contract Administrator.

.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 QUALITY CONTROL

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

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

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

.4 The City will pay costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services .

.5 Test shear studs in accordance with CSA W59.

3.6 FIELD PAINTING

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

.1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP-6 except as specified otherwise. Apply in accordance: CAN/CGSB 85.10.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-1.105-M91, Quick Drying Primer.
- .3 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .4 CAN/CGSB-85.100-93, Painting.

.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-M1989(R2001), Welded Steel Construction (Metal Arc Welding) Metric.
- .7 CSA-W59S1-M1989(R1998), Supplement No.1-M1989, Steel Fixed Offshore Structures, to W59- M1989, Welded Steel Construction (Metal Arc Welding).

1.2 QUALITY ASSURANCE

.1 Submit 3 copies of mill test reports at least 4 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.

1.3 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 CSA-S136.

.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 Submit 6copies of calculations and joist design drawings for typical joists for Consultant review at least 4weeks prior to fabrication and/or delivery.

1.4 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 Provinces 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.

.5 Reproduction of contract drawings for use as erection drawings is not permitted.

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 Consultant licensed in the 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.

.5 Reproduction of contract drawings for use as erection drawings is not permitted.

1.6 MATERIAL DELIVERY, STORAGE & HANDLING:

.1 Verify available storage space on site.

.2 Handle, store steel joists on site to cause no damage to other materials, to existing property, to new structure.

.3 Store steel joists under cover on blocks, skids, clear of ground, standing water.

1.7 LEED REQUIREMENTS

.1 See Section 01 35 21 - LEED Requirements.

.2 LEED Submittals: Submit LEED supporting documentation in accordance with Section 01 35 21 - LEED Requirements.

.3 Waste Management and Disposal: Dispose of packaging and waste materials in appropriate on-site bins for recycling and disposal in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Recycled Content: Supply building materials with recycled materials (post consumer plus ½ post-industrial content) in accordance with LEED Materials and Resources Credits MR 4.1 & 4.2 – Recycled Content.

.5 Regional Materials: Supply building materials that are regionally extracted, harvested, or recovered within 800km of the project location when shipped by truck, or within 2400km of the project location when shipped by rail, in accordance with LEED Materials and Resources Credit MR 5.1 & 5.2 – Regional Materials.

.6 Indoor Environmental Quality Credit EQ 4 – Low - Emitting Materials.

.1 LEED Indoor Environmental Quality Credit EQ 4.1 – Low-Emitting Materials: Adhesives and Sealants.

.1 Low VOC complying with SCAQMD Rule #1168, Latest edition.

.2 LEED Indoor Environmental Quality Credit EQ 4.2 – Low-Emitting Materials: Paints and Coatings.

.1 Architectural paints, coatings and primers applied to interior walls and ceilings to Green Seal Standard GS-11, latest edition.

.2 Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates to Green Seal Standard GS-03, latest edition.

.3 Clear wood finishes, floor coatings, stains and shellacs applied to interior elements to SCAQMD Rule 1113, latest edition.

Part 2 Products

2.1 NOTE:

.1 See the Structural Drawings for further information.

.2 In any situation where the specifications do not agree with the Structural Drawings or the Geotechnical report:

.1 The Structural Drawings and Geotechnical Report shall govern.

.2 The Consultant must be alerted, who will then confirm the requirements.

2.2 MATERIALS:

.1 Recycled Content: Steel to contain ≥ 35% recycled material. (Post consumer plus ½ post-industrial content.)

.2 Regional Materials: Steel to meet LEED Regional Materials requirements.

.3 Open web steel joists: Refer to Structural Drawings – Shop prime and paint finish

.1 Bridging by Open Web Steel Joist supplier – Refer to Structural Drawings

.4 Structural steel: as indicated in drawings.

.5 Welding materials: as indicated in drawings.

.6 Shop paint primer: in accordance with Section 09 91 23 – Painting.

.1 Low VOC as per LEED requirements.

.7 Shear studs: to CSA-W59, Appendix H with CSA-W59S1.

2.3 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 and with CSA-W59S1.

.3 Provide chord extensions where indicated.

.4 Provide diagonal and horizontal bridging and anchorage as indicated.

.5 Weld studs to chords for attachment purposes as indicated.

.6 Install shear studs in accordance with CSA-W59 and with CSA-W59S1.

.7 Build in specific camber.

2.4 SHOP PAINTING

.1 Clean, prepare and shop prime surfaces of steel joists to CAN/CSA-S16 and in accordance with Section 09 91 23 – Painting.

.1 Low VOC as per LEED requirements.

.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 2 primer to steel surfaces to achieve maximum dry film thickness of .065 mm to .080 mm 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 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.

.1 65 mm on steel edge.

.2 100 mm on masonry.

.5 Install bridging before application of construction loads and anchor bridging lines to walls and other supporting structural members as indicated on the drawings.

.6 Weld joists to each compressions flange, chord of supporting steel member receiving full lateral support at maximum interval not exceeding fifteen times flange, chord width.

.7 Refer to drawings for bearing plates, anchors, joists, seats, etc. not specified herein.

.8 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 Contract Administrator 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 Representatie.

.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. Contract Administrator will determine extent of and identify all inspections.

.3 Submit test report to Contract Administrator within 5 days after completion of inspection.

.4 Test shear studs in accordance with CSA-W59.

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 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.

3.5 FIELD PAINTING

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

.1 Low VOC as per LEED requirements.

.2 Touch up all damaged surfaces and surfaces without shop coat with CISC/CPMA-1, CISC/CPMA-2-75, CAN/CGSB-1.105, CAN/CGSB-1.40 in accordance with manufacturers' recommendations to CAN/CGSB-85.10.

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-M1989(R2001), Welded Steel Construction, (Metal Arc Welding) Metric.

.4 Canadian Sheet Steel Building Institute (CSSBI)

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

.2 CSSBI 12M-96, 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 plaster 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, Appendix 'G'.

1.3 SHOP DRAWINGS

.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 or licensed in Provinces of Manitoba, Canada.

.3 Submit design calculations if requested by Consultant.

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

.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.

1.4 LEED REQUIREMENTS

.1 See Section 01 35 21 - LEED Requirements.

.2 LEED Submittals: Submit LEED supporting documentation in accordance with Section 01 35 21 - LEED Requirements.

.3 Waste Management and Disposal: Dispose of packaging and waste materials in appropriate on-site bins for recycling and disposal in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Recycled Content: Supply building materials with recycled materials (post consumer plus ½ post-industrial content) in accordance with LEED Materials and Resources Credits MR 4.1 & 4.2 – Recycled Content.

.5 Regional Materials: Supply building materials that are regionally extracted, harvested, or recovered within 800km of the project location when shipped by truck, or within 2400km of the project location when shipped by rail, in accordance with LEED Materials and Resources Credit MR 5.1 & 5.2 – Regional Materials.

.6 Indoor Environmental Quality Credit EQ 4 – Low - Emitting Materials.

.1 LEED Indoor Environmental Quality Credit EQ 4.1 – Low-Emitting Materials: Adhesives and Sealants.

.1 Low VOC complying with SCAQMD Rule #1168, Latest edition.

.2 LEED Indoor Environmental Quality Credit EQ 4.2 – Low-Emitting Materials: Paints and Coatings.

.1 Architectural paints, coatings and primers applied to interior walls and ceilings to Green Seal Standard GS-11, latest edition.

.2 Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates to Green Seal Standard GS-03, latest edition.

.3 Clear wood finishes, floor coatings, stains and shellacs applied to interior elements to SCAQMD Rule 1113, latest edition.

Part 2 Products

2.1 NOTE:

.1 See the Structural Drawings for further information.

.2 In any situation where the specifications do not agree with the Structural Drawings or the Geotechnical report:

.1 The Structural Drawings and the Geotechnical report shall govern,

.2 The Consultant must be alerted, who will then confirm the requirements.

2.2 MATERIALS

.1 Recycled Content: Steel to contain ≥ 35% recycled material. (Post consumer plus ½ post-industrial content.)

.2 Regional Materials: Steel to meet LEED Regional Materials requirements.

.3 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A653/A653M structural quality

.1 Grade and coatings as per drawings.

.4 Acoustical fluted deck pan insulation: inert, fibreglass sound absorbing batts as per specification Section 07 21 16 – Blanket Insulation. Strips cut to proper width and profiled to suit trapezoidal deck flutes. Coordinate with Section 07 53 00 – Modified Bituminous Roofing.

.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 and in accordance with Section 09 91 23 – Painting.

.1 Low VOC as per LEED requirements.

.7 Sealants: to Section 07 92 10 – Joint Sealants.

.8 Shear studs: to CSA W59.

2.3 TYPES OF DECKING

.1 Steel roof deck: As indicated on Structural Drawings.

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 erection drawings.

.2 Lap ends: to 50 mm minimum.

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

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

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

.6 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.

.7 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.

.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.

3.6 SCHEDULE

.1 Perforated decking with acoustic flute fillers.

.1 M01 – Circulation / Gathering Area.

.2 M13 – Gymnasium

.3 Note: Existing mini-gym has existing perforated decking. Coordinate new acoustic flute fillers with Section 07 21 16 – Blanket Insulation and Section 07 53 00 – Modified Bituminous Roofing.

.2 Non-perforated decking:

.1 All other areas.

END OF SECTION

Part 1 General

1.1 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 Steamless.

.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).

.5 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 The Environmental Choice Program

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

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

1.2 SUBMITTALS

.1 Product Data:

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

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

.1 For finishes, coatings, primers and paints.

.2 Shop Drawings

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

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

.3 All ladder, stair, handrail, guardrail shop drawings to be reviewed and stamped by a Structural Engineer registered in Province of Manitoba, Canada.

1.3 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.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

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

.2 Storage and Protection:

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

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

1.5 LEED REQUIREMENTS

.1 See Section 01 35 21 - LEED Requirements.

.2 LEED Submittals: Submit LEED supporting documentation in accordance with Section 01 35 21 - LEED Requirements.

.3 Waste Management and Disposal: Dispose of packaging and waste materials in appropriate on-site bins for recycling and disposal in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Recycled Content: Supply building materials with recycled materials (post consumer plus ½ post-industrial content) in accordance with LEED Materials and Resources Credits MR 4.1 & 4.2 – Recycled Content.

.5 Regional Materials: Supply building materials that are regionally extracted, harvested, or recovered within 800km of the project location when shipped by truck, or within 2400km of the project location when shipped by rail, in accordance with LEED Materials and Resources Credit MR 5.1 & 5.2 – Regional Materials.

.6 Indoor Environmental Quality Credit EQ 4 – Low - Emitting Materials.

.1 LEED Indoor Environmental Quality Credit EQ 4.1 – Low-Emitting Materials: Adhesives and Sealants.

.1 Low VOC complying with SCAQMD Rule #1168, Latest edition.

.2 LEED Indoor Environmental Quality Credit EQ 4.2 – Low-Emitting Materials: Paints and Coatings.

.1 Architectural paints, coatings and primers applied to interior walls and ceilings to Green Seal Standard GS-11, latest edition.

.2 Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates to Green Seal Standard GS-03, latest edition.

.3 Clear wood finishes, floor coatings, stains and shellacs applied to interior elements to SCAQMD Rule 1113, latest edition.

Part 2 Products

2.1 MATERIALS

.1 Recycled Content: Steel to contain ≥ 35% recycled material. (Post consumer plus ½ post-industrial content.)

.2 Regional Materials: Steel to meet LEED Regional Materials requirements.

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

.4 Steel pipe: to ASTM A53/A53M.

.5 Steel plate and tubing to CAN/CSA-G40.20/G40.21.

.6 Welding materials: to CSA W59.

.7 Welding electrodes: to CSA W48 Series.

.8 Bolts and anchor bolts: to ASTM A307.

.9 High strength bolts: to ASTM A325M.

.10 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 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

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

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

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

2.3 FINISHES

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

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

.1 Shop primers shall be coordinated with 09 91 23 – Painting.

.2 Surface preparation, cleaning and priming to be in accordance with 09 91 23 – Painting.

.3 Low VOC in accordance with LEED requirements.

.4 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.

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 BOLLARDS

.1 152 mm ϕ diameter steel bollard, 914 high and to 1524 mm below grade.

.2 Galvanized.

.3 Fill with concrete – ensure smooth rounded top.

.4 Locations: Refer to Site Plan.

2.6 PARKING OUTLET POSTS

.1 W150 x 24 steel post, length as shown — see electrical drawings.

.2 Prepare posts for electrical outlet attachment as required.

.3 Galvanized finish.

2.7 SUMP PIT COVERS

.1 Sump Covers: 6 x 914 x 914mm checker plate cover:

.1 Split in half for pipe through the plate.

.2 Hinge to angle frame.

.3 Cut pipe diameter opening in plate.

.2 50 x 50 x 6 mm angle with a 25 x 6 mm raised lip to seat the plate cover. Anchor angle into the concrete.

.3 Galvanized finish.

2.8 SPLASH PAD LEDGES

.1 Supply and install two 64mm galvanized HSS spacers per splashpad angle. Mechanically fasten to grade beam.

.2 100mm Galvanized splashpad support angle to be supplied by splashpad manufacturer. See Section 03 48 00 – Precast Concrete Specialties.

.1 Mechanically fasten splashpad support angle to

2.9 RAINWATER LEADER COVERS

.1 Install round HSS vandalism covers over rainwater leaders penetrating walls.

.1 See drawings for installation and intent.

.2 Diameter of HSS to be sized according to rainwater leader diameter.

.3 Steel thickness to be min. 3mm.

.4 Weld 100x50x3mm attachment plates above and below each cover for attachment to wall. Pre-drill for fasteners.

.5 Galvanized finish.

.6 Mechanially fasten to wall.

2.10 ROOF ACCESS LADDERS

.1 Roof access ladders to meet Workplace Safety and Health Guidelines and ANSI A14.3 “Safety Requirements for Fixed Ladders”.

.2 10 x 65mm vertical bar to heights indicated.

.1 Exterior ladders: Extend over and around back side of parapet as indicated.

.2 Interior ladders to roof hatches: Install ‘Ladder-Up Safety Post’ by Bilco or approved equivalent in accordance with B6 Substitutes.

.3 19mm dia. steel rungs at 300mm o.c.

.4 10x65mm steel support brackets at max. 1200 o.c.

.1 Coordinate support blocking at bracket locations.

.2 Mechanically fasten.

.5 Ladder cage to be installed where indicated on drawings.

.1 Top and bottom cage hoops to be bent 10x76mm steel bars.

.2 Intermediate cage hoops to be bent 10x51mm steel bars at at max. 1200 o.c.

.3 Vertical cage bars to be 6.35x38mm steel bars – 7 pieces evenly spaced.

.4 Vertical support rods as required.

.6 Where indicated on drawings: Install hinged non-climbable closure panel to dimensions indicated.

.7 Finish:

.1 Prime and paint interior ladders in accordance with Section 09 91 23 – Painting.

.1 Low VOC as per LEED requirements.

.2 Exterior ladders to be galvanized.

2.11 MECHANICAL AHU SUPPORT PLATFORM

.1 Fabricate Air Handling Unit and Condensing Unit support platforms as detailed in Architectural and Structural drawings.

.2 Coordinate and confirm Mechanical Unit sizes and requirements with Mechanical Contractor.

.3 Finish: Galvanized.

2.12 HRV HANGING BRACKET AND SERVICE PLATFORM

.1 Fabricate HRV hanging bracket and service platform as detailed in Architectural and Structural drawings.

.2 Coordinate and confirm HRV machine size and service space requirements with Mechanical Contractor.

.3 Provide opening in ladder cage to permit access onto service platform.

.4 Finish: Prime and paint in accordance with 09 91 23 – Painting.

.1 Low VOC prime and paint in accordance with LEED requirements.

2.13 HANDRAILS / GUARDRAILS

.1 Fabricate handrails and guardrails as detailed in drawings.

.2 Verticals posts: 38mm steel tubing welded to 100x75x6mm steel base plates.

.1 Mechanically fasten through 4 equally spaced predrilled countersunk holes.

.3 Horizontals: 38mm steel tubing.

.4 Handrails: 38mm steel tubing.

.1 Where shown, mount to posts with 13mm dia steel supports.

.2 Provide 76x76x3mm attachment plates where handrails are mounted to walls – mechanically fastened to wall through equally spaced predrilled countersunk holes.

.3 Coordinate blocking in stud walls at attachment locations.

.5 NOTE: Handrails / Guardrails for upper and lower flights of Stairway 01 are to be separately constructed and installed to permit future removal of lower flight handrail. This is

to permit future removal of lower handrail to facilitate moving large objects up and down the lower flight of stairs.

.6 Pickets: 13mm square pickets at 100mm o.c.

.7 Cap and weld exposed ends.

.8 Grind smooth.

.9 Exterior finish: galvanized.

.10 Interior finish: Prime and paint in accordance with 09 91 23 – Painting.

.1 Low VOC prime and paint in accordance with LEED requirements.

2.14 ROOF ANCHORS

.1 Coordinate to 07 72 69 – Anchors and Safety Constraints.

.2 Provide crosstube assembly for anchoring joist mounted roof anchors:

.1 6 mm x 102 mm x 102 mm HSS.

.2 To lengths required to span three joists. (Length varies.)

.3 Provide pre-drilled anchor plates each end of crosstube assembly to roof anchor manufacturer's requirements.

.4 Prime and paint in accordance with 09 91 23 – Painting.

.1 Low VOC prime and paint in accordance with LEED requirements.

2.15 VANITY SUPPORT BRACKETS

.1 100 x100 x 6.3 mm steel angles.

.1 1200mm length vertical segment in walls – fasten to wall studs at four evenly spaced locations.

.2 500mm length horizontal segment underneath counters – fasten to support gables at three evenly spaced locations.

.3 Locate at each millwork gable.

.2 Pre-drill for fastening to wall and countertops.

.3 Coordinate blocking where and as required for mounting.

.4 Prime coat and paint in accordance with 09 91 23 – Painting.

.1 Low VOC prime and paint in accordance with LEED requirements.

2.16 STAIR LANDING TRIM

.1 Install 50x50x3mm steel angle trim as detailed on drawing 8 / 8.2.

.2 Prime coat and paint in accordance with 09 91 23 – Painting.

.1 Low VOC prime and paint in accordance with LEED requirements.

2.17 MECHANICAL COMPOUND FENCING

.1 Posts: HSS 102x76x4.8mm – weld to base plates.

.2 Horizontal girt angles: 65x65x6mm – weld to posts.

.3 Base plates: 228x338x13mm – bolt to concrete with four corrosion resistant - 16 dia. x 150mm long Hilti kwik bolt 3 expansion anchors.

.4 Dimensions and arrangement as per drawings.

.5 Galvanized finish.

.6 Finish with vertically installed corrugated metal cladding. Coordinate with Section 07 46 13 – Preformed Metal Siding.

2.18 CEILING TRELLIS

.1 Location, detailing and quantities as indicated in drawings.

.2 Panel corner reinforcement angles: 38x38x2mm by 75mm long. Predrilled for fasteners.

.3 Ceiling trellis support angles: 75x50x4mm. Length to suit panels.

.4 Hanging rods: 6mm steel rods complete with turnbuckles for height adjustments. Two rods per trellis support angle.

.5 Roof attachment angles: 50x50x4mm by 50mm long steel angles. Weld to hanging rods and predrilled for attachment of rods to roof structure.

.6 Finish: Prime coat and paint in accordance with 09 91 23 – Painting.

.1 Low VOC prime and paint in accordance with LEED requirements.

2.19 MISCELLANEOUS

.1 Review Architectural and Structural drawings for fabricated steel requirements.

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 CORNER GUARDS

.1 Install corner guards in locations as indicated.

3.3 CLEANING

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

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

END OF SECTION