3.4 Concrete Protection for Reinforcement

.1 Ensure reinforcement is placed to provide minimum concrete cover in accordance with CAN/CSA-A23.1.

3.5 Conduits and Pipes

.1 Conduit and pipe embedded in concrete shall be of a material not harmful to the concrete and shall:

.1 Not displace more than 4% of the area of the cross section of a column on which stress is calculated, including the area of concrete displaced by the bending of the conduit or exit path of the conduit out of the column.

.2 Not be spaced closer than three diametres on centre.

.3 Have a concrete covering of not less than 25 mm.

.4 Be so installed that it will not require cutting, bending or displacement of the reinforcement or impair the structural strength of the system.

3.6 Install Items Specified Under Other Sections

.1 Install hangers, sleeves, anchors, etc. specified under other Sections.

.2 Pour concrete after other trades have satisfactorily installed their materials.

.3 Do not eliminate or displace reinforcement to accommodate hardware. If hangers, inserts, anchors, etc. cannot be located as specified obtain approval of all modifications from Engineer before placing concrete.

3.7 Equipment Pads

.1 Provide concrete pads for equipment where and as indicated on drawings. Adjust dimensions of pads to suit final equipment sizes as per reviewed shop drawings.

.2 Steel trowel top surface smooth.

3.8 Curing and Protection

.1 Cure and protect freshly placed concrete in accordance with CAN/CSA-A23.1 using moist curing methods only.

.2 AI concrete shall receive moist curing for a period of at least seventy two hours.

.3 One of the following methods shall be used as soon as the concrete has hardened sufficiently to prevent marring:

.1 Surface covered with canvas or other satisfactory material and kept thoroughly wet.

.2 Surface sealed with polyethylene sheeting at least 6 mils thick and the concrete kept thoroughly wet.

.3 LIQUID MEMBRANE, CURING COMPOUNDS MAY NOT BE USED.

.4 The Contractor shall protect and heat, where necessary, all concrete which has been placed when the air temperature is 5°C. or below. When the air temperature is likely to fall below 5°C. at any time during the twenty four hours after the concrete is placed, the concrete shall then also be protected and heated, when necessary, from the time the concrete is placed. When the air temperature falls below 5°C. during the seven days after the concrete is placed, the Contractor to institute protection and heating where necessary to prevent damage to the concrete by freezing or to allow the concrete to develop sufficient strength to carry the dead and live loads which will be imposed on it by further construction work or general use in the near future.

.4 The system of protection, surface or enclosed with heating, where necessary, (or fully insulated forms), must be adequate and designed in relation to ambient conditions and the type of construction to satisfactorily achieve these curing conditions in the concrete.

.5 For proper curing of concrete the temperature of all surfaces of the concrete shall be maintained at not less than 20°C. for five days or at not less than 10°C. for seven days after placing. Further, the concrete shall be kept above freezing temperature for a period of at least nine days and shall be kept from alternate freezing and thawing for at least fourteen days after placement.

.6 No salt or other chemicals shall be used to lower the freezing point of the concrete as a substitute for the specified curing and protection.

.7 At the end of the specified protection period, the temperature of the concrete shall be reduced gradually at a rate not exceeding 10°C per day until the outside air temperature has been reached.

.8 The Contractor shall keep a full record of the temperature of concrete upon placing and a daily record of the curing temperature of the concrete for the full protection period.

.9 Concrete which is allowed to freeze or which obtains insufficient curing conditions shall be subject to all necessary investigations and testing as deemed necessary by the Engineer. If found unsatisfactory, all such concrete shall be removed and the portion reconstructed as directed by the Engineer.

.10 The cost incurred by the Engineer for such investigation, testing or inspection of reconstruction and the cost of reconstruction shall be borne by the Contractor.

3.9 Formed Concrete

.1 Inspect concrete surfaces immediately upon removal of forms.

.2 Treat imperfections in formed surfaces in accordance with CAN/CSA-A23.1-LATEST and to Engineer's approval – all required patches shall be completed using the specified patching mortar.

.3 Modify or replace concrete not conforming to qualities, lines, details and elevations specified herein or indicated on drawings.

3.10 Surfacing and Finishing

.1 Ordinary Surface Finish:

.1 Immediately following the removal of forms, all fins and irregular projections shall be removed from all surfaces except those which are not to be exposed or not to be waterproofed. On all surfaces the cavities produced by form ties, if specified to be filled, and all other holes, honeycomb spots, broken corners or edges and other defects shall be thoroughly cleaned and after having been kept saturated with water for a period of not less than three hours, shall be carefully pointed and trued with the specified mortar. The mortar patches shall be cured as specified under "Curing". All construction and expansion joints in the completed work shall be left carefully tooled and free from all mortar and concrete. The joint filler shall be left exposed for its full length and with clean and true edges. An approved acrylic polymer bonding agent shall be used in all repair mortar.

.2 The resulting surfaces shall be true and uniform; to the satisfaction of the Owner.

.2 Floated Surface Finish:

.1 After the concrete has been compacted, the surface shall be carefully rodded and evened to conform to the cross-section and grade shown on the Drawings. Proper allowance shall be made for camber, if required.

3.11 Defective Concrete

.1 Concrete not meeting the requirements of the Specifications and Drawings shall be considered defective concrete.

.2 Concrete not conforming to the lines, detail and grade specified herein or as shown on the Drawings shall be modified or replaced at the Contractor's expense and to the satisfaction of the Engineer. Finished lines, dimensions and surfaces shall be correct and true within tolerances specified herein and in the Formwork Section of these Specifications.

.3 Concrete not properly placed resulting in excessive honeycombing, and all honey-combing and other defects in critical areas of stress shall be repaired or replaced at the Contractor's expense and to the satisfaction of the Owner.

.4 To conform to the strength requirements, the average of all tests shall exceed the specified strength. When five or more tests of the same class of concrete are available, the average of any five consecutive tests shall be equal to, or greater than the specified strength, and no

strength test shall fall more than 3.5 MPa below the specified strength. If any of the criteria of the above clause are not met, the Engineer shall have the right to require one or more of the following:

.1 Changes in mix proportions for the remainder of the work.

.2 Cores drilled and tested from the areas in question as directed by the Engineer and in accordance with CAN/CSA-A23.2. The test results shall be indicative of the strength of the in-place concrete.

.3 Load testing of the structural elements. The changes in the mix proportions and the testing shall be at the Contractor's expense.

.4 Concrete failing to meet the strength requirements of this specification shall be strengthened or replaced at the Contractor's expense and the satisfaction of the Owner.

3.12 Patching

.1 Allow Engineer to inspect concrete surfaces immediately upon removal of all formwork.

.2 Patch imperfections when concrete is green.

.3 Remove all exposed metal form ties, nails and wires, break off fins and remove all loose concrete.

.4 Thoroughly wet all form tie pockets and patch with patching mortar followed by proper curing.

.5 Chip away honeycombed and other defective surfaces to depth of not less than 25mm with the edges perpendicular to the surface. Thoroughly wet and patch with patching mortar followed by proper curing.

3.13 Protection

.1 Use protective measures to ensure that completed work is not damaged from freezing conditions, frost heaving or inclement weather.

.2 Any concrete surfaces damaged from nearby construction work shall be repaired to Owner's satisfaction.

3.14 Clean-Up

.1 As work progresses, remove from site all debris and excess materials.

.2 At completion of work, remove from site all debris, excess materials and equipment.

END OF SECTION

DIVISION 4
MASONRY
(NOT APPLICABLE)

DIVISION 5
METALS

TABLE OF CONTENTS
DIVISION 5 - METALS

1. GENERAL

1.1 Work Included

.1 Structural steel beams, purlins, bracing.

.2 Baseplates, bearing plates, anchor bolts.

.3 Stairs

.4 Handrails

.5 Welds, bolts, washers, nuts and shims.

.6 Frames, hangers, struts.

.7 Galvanize structural steel members and appurtenances.

.8 Field touch up of galvanized surfaces including field welding.

1.2 Related Work

.1 Placement of anchor bolts, bearing plates and angles cast in concrete: Section 03300

1.3 Design Standards, Code Requirements

.1 Conform to requirements of CAN/CSA S16.1-Latest, CAN/CSA-S136-Latest, the Canadian Institute of Steel Construction (CISC) "Code of Standard Practice for Buildings" and the applicable safety regulations.

.2 Use loads, load combinations and stress levels shown on drawings and in accordance with the National Building Code of Canada.

.3 Connections are to be designed by a Professional Structural Engineer.

.4 Perform all welding in accordance with requirements of CSA W59.

1.4 Qualifications

.1 All work is to be performed by a firm certified by the Canadian Welding Bureau to the requirements of CSA W47.1.

.2 All welders employed for erection are to possess valid "S" Classification Class "O" certificates issued by the Canadian Welding Bureau.

1.5 Inspection and Testing

.1 Shop and field inspection and testing may be performed by an Inspection and Testing Firm appointed and paid by the Owner.

.2 Provide free access to all portions of work in the shop and in the field and cooperate with appointed firm.

.3 Pay all additional costs for inspection and re-inspection due to defective workmanship or materials.

.4 If requested by the Engineer, submit four (4) copies of mill test reports, properly correlated to materials actually used.

.5 Radiographic and magnetic particle inspection of welds may be performed by the Inspection and Testing Firm, in accordance with CSA W59 and ASTM E109, when required by the Engineer.

.6 Welds are to be considered defective if they fail to meet quality requirements of CSA W59.

.7 Additionally, all welds may be visually inspected.

.8 High Tensile bolted connections may be inspected and tested in accordance with Clause 22.7, CAN/CSA S16.1-M89.

1.6 Shop Drawings, Submittals

.1 Submit details of typical connections and special connections for review prior to preparation of shop drawings.

.2 Submit shop drawings for review in accordance with Section 01300.

.3 Clearly indicate profiles, sizes, spacing and locations of structural members, connections, attachments, reinforcing, anchorage, framed openings, size and type of fasteners, cambers and loads, accessories, column anchor bolt locations, setting details.

.4 Include elevations and details.

.5 Indicate welded connections using welding symbols in compliance with CISC Welding Standards. Clearly indicate net weld lengths.

.6 Shop drawing review by the Engineer is solely to ascertain conformance to the general design concept.

.7 Responsibility for approval of detail design inherent in shop drawings rests with the Contractor and review by the Engineer shall not imply such approval.

.8 Review shall not relieve the Contractor of his responsibility for errors or omissions in shop drawings or for proper completion of the Work in accordance with the Contract Documents.

.9 Responsibility for verification and correlation of field dimensions, fabrication processes, techniques of construction, installation and coordination of all parts of the Work rests with the Contractor.

2. PRODUCTS

Type		
G	-	General Construction Steel
W	-	Weldable Steels
T	-	Weldable Low Temperature Steels
R	-	Atmospheric Corrosion Resistant Structural Steel
A	-	Atmospheric Corrosion Resistant Structural Steel With Improved Low Temperature Properties
Q	-	Quenched and Tempered Low Alloy Steel Plate

2.1 Materials

.1 All materials are to be new.

.2 Structural Steel: conforming to CAN/CSA G40.21-92, Type W with yield strength of 350 MPa or higher.

.3 Hollow Structural Sections: conforming to CAN/CSA G40.21-92, Type W, yield strength of 350 MPa, Class C.

.4 Cold formed sections to CAN/CSA S-136, yield strength of 350 Mpa.

.5 Bolts, Nuts and Washers: conforming to ASTM A325; finished to match members to which they attach.

.6 Anchor Bolts: fabricated from material conforming to CAN/CSA G40.21-92, Type W, yield strength 300 MPa; nuts and washers to be of equal or greater strength than bolts. Hot Dipped Galvanized

.7 Welding Materials: conforming to CSA W59.

.8 Concrete Anchors: see concrete accessories Section 03250.

.9 Galvanizing: conforming to CSA G164; minimum 600 g/m^2 coating.

2.2 Fabrication

.1 Fabricate structural steel members in accordance with CAN/CSAS16.1-Latest and CAN/CSA S136-Latest.

.2 Verify all drawing dimensions prior to commencing fabrication.

.3 Provide connections for loads shown.

.4 Provide connections as detailed.

.5 Accurately cut and mill column ends and bearing plates to assure full contact of bearing surfaces prior to welding.

.6 Design and detail connections for structural steel so that corrosion potential is minimized. Cap and seal weld all exposed ends of HSS sections.

.7 All steel fabrications shall be hot dipped galvanized after fabrication unless noted otherwise.

3. EXECUTION

3.1 Examination

.1 Before starting erection, take field measurements and examine other work may affect this work.

.2 Notify the Engineer of any conditions which would prejudice proper installation of this work.

.3 Commencement of this work implies acceptance of existing conditions.

3.2 Damaged Members

.1 Repair or replace members damaged during transit or erection, before securing in position.

3.3 Erection

.1 Erect structural steel in accordance with CAN/CSA S16.1-Latest and drawings.

.2 Field connections are to be bolted unless noted otherwise.

.3 Make adequate provision for all erection loads, and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of necessary permanent bracing.

.4 Set column bases and other vertical members to design elevations on levelling nuts or steel wedges. Do not use wood wedges.

.5 Use only light drifting to draw parts together. Enlarge holes for bolted connections with reamers or twist drill only. Do not burn to form holes, enlarge holes or match unfair holes.

.6 Erection error is not to exceed requirements of CAN/CSA S16.1-Latest.

.7 Obtain Engineer's written permission prior to field cutting or altering structural members.

.8 Touch up all damaged galvanizing.

END OF SECTION

STRUCTURAL ALUMINUM

1. GENERAL

1.1 Reference Standards

.1 Conform to the following reference standards in accordance with Section 01400:

.1 CGSB 1-GP-108, Paint, Acid and Alkali Resistant, Black.

.2 CSA HA Series, CSA Standards for Aluminum and Aluminum Alloys.

.3 CAN3-S157, Strength Design in Aluminum.

.4 CSA W59.2 Welded Aluminum Construction.

.5 CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.

1.2 Submittals for Information Only

.1 Submit shop details and erection drawings in accordance with Section 01300.

.2 All submissions shall bear the stamp and signature of a qualified professional engineer registered in the Northwest Territories and Nunavut.

.3 Indicate cuts, copes, connections, holes, threaded fasteners, rivets, welds, painted areas and other items. Indicate welds using CWB Welding Symbols.

.4 Submit description of methods, sequence of erection and type of equipment to be used in erecting structural aluminum.

1.3 Quality Control

.1 Prior to commencing of work, submit 4 certified copies of mill reports covering chemical and physical properties of aluminum used in this work.

.2 Submit proof of certification to W47.2, Division 1.

2. PRODUCTS

2.1 Materials

.1 Aluminum bar, rod, wire and extruded shapes: to CSA HA.5 6061-T6.

.2 Aluminum sheet or plate: to CSA HA.4 6061-T6.

.3 Aluminum drawn tubes: to CSA HA.7 6061-T6.

.4 Bolts and fasteners: Stainless Steel to AISI Type 316 or 304 as shown or otherwise indicated.

.5 Aluminum welding wire: to CSA HA.6 4043.

.6 Bituminous paint: to CGSB 1-GP-108 Type 1.

2.2 Finishes

.1 Aluminum finish: to Aluminum Association designation AA-M12 C22 A31 clear finish where shown.

3. EXECUTION

3.1 General

.1 Fabricate in accordance with CAN3-S157 and in accordance with reviewed shop drawings.

.2 Do welding in accordance with CSA W59.2 except where specified otherwise.

.3 Use qualified fabricators in accordance with CSA W47.2.

.4 Ensure all dissimilar metals are isolated from contact with aluminum.

.5 Apply two coats of bituminous paint to areas shown on shop drawings.

3.2 Connection to Existing Work

.1 Verify dimensions and condition of existing work before commencing fabrication and report any discrepancy and potential problem areas to Engineer.

3.3 Erection

.1 Erect structural aluminum as indicated and in accordance with CAN3-S157 and reviewed erection drawings.

.2 Obtain written permission from Engineer prior to field cutting or altering of structural members.

.3 Surface preparation of aluminum in contact with dissimilar materials: to CAN3-S157. All locations to be treated as if they were in presence of moisture.

.4 Design all temporary bracing required for erection.

3.4 Testing

.1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Engineer in accordance with Section 01400.

.2 Testing laboratory will use ultra-sonic testing procedures to verify soundness of some representative shop and field welds. In principal structural members, shop and field welds will be X-rayed. Representative bolted connections will be checked with torque wrench. Engineer will determine location and extent of all testing.

3.5 Field Painting

.1 Paint in accordance with Section 09905 where shown or otherwise required.

END OF SECTION

1. GENERAL

1.1 Related Sections

.1 Section 09911 Interior Painting.

.2 Section 05310 Steel Deck.

1.2 References

.1 Canadian Standards Association (CSA).

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

.2 CAN/CSA-G40.21, Structural Quality Steels.

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

.4 CAN/CSA-S136-94, Cold Formed Steel Structural Members.

.5 CSA W47.1-92, Certification of Companies for Fusion Welding of Steel Structures.

.6 CSA W55.3-1965, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.7 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding).

.8 CSA W59S1-M1989, Supplement No. 1 to W59-M1989 Welded Steel Construction (Metal Arc Welding).

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.40, Primer Structural Steel, Oil Alkyd Type.

.2 CAN/CGSB-1.105, Quick Drying Primer.

.3 CGSB 85-GP-14M, Painting Steel Surfaces Exposed to Normally Dry Weather.

.4 CAN/CGSB-85.100-93, Painting.

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

.1 CISC/CPMA2-75, Quick-Drying, Primer for Use on Structural Steel.

.2 CISC/CPMA1-73b, Quick-Drying, One-Coat Paint for Use on Structural Steel.

1.3 Quality Assurance

.1 Fabricator of structural steel joists, in addition, provide an affidavit stating that materials and products used in fabrication conform to applicable material and products standards called for by design drawings and specifications.

1.4 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 CSA S16.01 and/or CSA S136-94(R2001).

.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 joist deflection due to specified live load to 1/240 of span and deflection due to specified total load to 1/180 of span.

.5 Submit copies of calculations and joist design drawings for typical joists for Owner review at least prior to fabrication and/or delivery.

1.5 Shop Drawings

.1 Submit shop details and erection drawings in accordance with Section 01300 - Submittal Procedures.

.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Northwest Territories, Nunavut.

.3 On erection drawings, indicate relevant details such as joist mark, depth, spacing, bridging lines, bearing, anchorage and other details.

.4 In shop details, provide particulars relative to joist geometry, framed openings, splicing details, bearing and anchorage. Include member size, properties, specified and factored member loads, and stresses under various loadings, deflection and camber.

2. PRODUCTS

2.1 Materials

.1 Structural steel: to CAN/CSA-G40.21-98 and CSA S136-94 (R2001).

.2 Welding materials: to CSA W59 (R2001) with CSA W59S1.

.3 Shop paint primer: to CISC/CPMA1 or CISC/CPMA2.

2.2 Fabrication

.1 Fabricate steel joists and accessories as indicated in accordance with CSA S16.01 CSA S136-94(R2001) and in accordance with sealed shop drawings.

.2 Weld in accordance with CSA W59-1989 (R2001) and with CSA W59S1.

.3 Provide chord extensions where indicated.

.4 Provide diagonal and horizontal bridgings and anchorages as indicated.

2.3 Shop Paintings

.1 Clean, prepare surfaces and shop prime all surfaces of steel joists to CSA S16.01 CAN/CGSC-85.100-93.

.2 Clean all 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/CMPA-2 primer to all steel surfaces to achieve maximum dry film thickness of .080mm 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°C.

.5 Maintain dry condition and 5°C minimum temperature until paint is thoroughly dry.

.6 Strip paint bolts, nuts, sharp edges and corners before prime coat is dry.

3. EXECUTION

3.1 General

.1 Structural steel work: in accordance with CSA S16.01 CSA S136-94(R2001).

.2 Welding: in accordance with CSA W59-1989 (R2001) and with CSA W59S1.

.3 Companies to be certified under Division1 or 2.1 of CSA W47.1-92 (R2001) for fusion welding and/or CSA W55.3-1965 (R1998) for resistance welding.

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

3.2 Connection to Existing Work

.1 Verify dimensions and condition of existing work; report any discrepancy and potential problem areas to Owner 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 Owner.

3.4 Erection

.1 Erect steel joists and bridging as indicated in accordance with CSA S16.01 and in accordance with 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: is not allowed.

.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 09911 - Interior Painting.

.2 Touch up all damaged surfaces and surfaces without shop coat with CISC/CPMA1 CISC/CPMA2.

END OF SECTION

STEEL DECK

1. GENERAL

1.1 Related Sections

.1 Section [09911] - [Painting].

.2 Section [05121] - [Structural Steel [for Buildings]].

.3 Section [05210] - [Steel Joists].

1.2 References

.1 Canadian Standards Association (CSA).

.1 CSA C22.2 No. 79-1978 (R1999)], Cellular Metal and Cellular Concrete Floor Raceways and Fittings.

.2 CSA S16.01 [94], Limit States Design of Steel Structures.

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

.4 CSA 47.1- [92], Certification of Companies for Fusion Welding of Steel Structures.

.5 CSA 55.3-[1965], Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.6 CSA W59-1989 (R2001) [M1989], Welded Steel Construction, (Metal Arc Welding) [Metric].

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.181-99 [92], Ready-Mixed Organic Zinc-Rich Coating.

.3 American Society for Testing and Materials (ASTM).

.1 ASTM A 653/A 653M-02a 653M-[95], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A 792/A 792M-02 792M-[95], Specification for Steel Sheet, 55%Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.4 Canadian Sheet Steel Building Institute (CSSBI).

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

.2 CSSBI 12M-[96], Standard forComposite Steel Deck.

1.3 Design Requirements

.1 Design steel deck using limit states design in accordance with [CSA S136-94(R2001)] [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] f span.

.4 Where vibration effects are to be controlled as indicated, dynamic characteristics of decking system to be designed to be in accordance with CSA S16.01, Appendix "G".

1.4 Shop Drawings

.1 Submit shop drawings erection and shoring drawings in accordance with Section [01330 - Submittal Procedures].

.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province [s] of [_____], Canada.

.3 Submit design calculations if requested by [Engineer] [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.

2. PRODUCTS

2.1 Materials

.1 Zinc-iron Alloy (ZF) coated steel sheet: to [ASTM A 653/A 653M-02a] structural quality Grade [230] [255] [_____], with ZF75 coating, for interior surfaces not exposed to weather, [painted] [unpainted] finish, [_____] mm minimum base steel thickness.

.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-02a] structural quality Grade [230] [255] [_____], with ZF75, coating,[regular spangle] [extra smooth] surface, [chemically treated for unpainted finish,] [not chemically treated for paint finish,] for exterior surfaces exposed to weather, [_____] mm minimum base steel thickness.

.4 Aluminum-zinc alloy (AZ) coated steel sheet: to [ASTM A 792/A 792M-02 792M] structural quality grade [230] [255 [_____],] with [AZ 150,] [AZ 180]coating, surface, [chemically treated for unpainted finish,] [not chemically treated for paint finish,] for exterior surfaces exposed to weather, [_____] mm minimum base steel thickness.

.5 Acoustic insulation: fibrous glass [17.5] kg/m n density profiled to suit deck flutes.

.6 Closures: [as indicated] in accordance with manufacturer's recommendations.

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

.8 Primer: zinc rich, ready mix to CAN/CGSB-1.181-99.

.9 Caulking: to Section 07 [_____] - [_____].

.10 Shear studs: to CSA W59-1989 (R2001).

2.2 Types of Decking

.1 Steel [roof] deck: [_____] mm minimum base steel thickness, [_____] mm maximum deep profile, [non-cellular] [cellular], interlocking side laps. Flat sheet for cellular deck, [_____] mm minimum base steel thickness.

.2 Acoustic steel [roof] deck: [_____] mm minimum base steel thickness, [_____] mm maximum deep profile, non-cellular, perforated on vertical face of flutes, interlocking side laps. Flat sheet for cellular deck, [_____] mm minimum base steel thickness.

.3 Composite steel [roof] deck: [_____] mm minimum base steel thickness, [_____] mm deep profile, [non-cellular] [cellular], [upright] [inverted] embossed fluted profile, interlocking side laps. Flat sheet for cellular deck, [_____] mm minimum base steel thickness.

.4 Cellular [roof] deck for electrical raceway: to CSA C22.2 No. 79-1978 (R1999).

3. EXECUTION

3.1 General

.1 Structural steel work: in accordance with CSA S136-94(R2001) and CSSBI 10M [and] CSSBI 12M.

.2 Welding: in accordance with CSA W59-1989 (R2001), except where specified otherwise.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1-92 (R2001) for fusion welding of steel and/or CSA W55.3-1965 (R1998) for resistance welding.

3.2 Erection

.1 Erect steel deck as indicated and in accordance with [CSA S136-94(R2001)] [CSSBI 10M] [and] [CSSBI 12M] and in accordance with [approved] [reviewed] erection drawings.

.2 Butt ends: to [1.5 to 3] mm gap. Install [steel cover plates] [or] [_____] 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 W59-1989 (R2001).

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

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

.7 Temporary shoring, if required, to be designed to support construction loads, wet concrete and other construction equipment. Do not remove temporary shoring until concrete attains 75% of its specified 28day compression strength.

.8 Place and support reinforcing steel as indicated.

3.3 Closures

.1 Install closures in accordance with approved details.

3.4 Openings and Areas of Concentrated Loads

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

.2 Frame deck openings with any one dimension between [150 to 300] mm as recommended by manufacturer, except as otherwise indicated.

.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.

END OF SECTION

METAL DECK

1. GENERAL

1.1 Work Included

.1 Metal roof deck complete with cover plates, closures, flashing, installation and fastenings.

.2 Metal aluminum cover deck complete with cover plates, closures, flashing, installation and fastenings.

.3 Angle framing around openings up to 450 mm maximum in any dimension.

.4 Cut openings through deck.

1.2 Related Work

.1 Structural framing around openings larger than 450 mm in any dimension: Section 05120

.2 Supply of bearing plates and angles: Section 05120

1.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 01300.

.2 Clearly indicate decking plan, deck profile dimensions and thicknesses, anchorage, supports, projections, openings and reinforcement, closures, flashings, applicable details and accessories.

.3 Shop drawings and design briefs are to bear the seal of a Professional Structural Engineer registered in the Northwest Territories and Nunavut.

2. PRODUCTS

2.1 Materials

.1 Steel: galvanized sheet steel conforming to ASTM A446, Grades A and B as shown in manufacturers' current literature, Z275 zinc coating.

.2 Closures: closed cell neoprene, profiled to deck corrugations.

.3 Primer: zinc dust/zinc oxide alkyd type, conforming to 1-GP-181M-77.

2.2 Deck and Related Accessories

.1 Roof Deck: 0.76 mm thickness base sheet steel, Z275 zinc coating, 38 mm deep profile.

.2 Cover Deck: 1.2 mm thickness base aluminum sheet, 38 mm deep profile.

.3 Closure Strips, Flashing, Cover Plates: 0.76 mm minimum thickness base sheet steel, Z275 zinc coating, or aluminum sheet, of required profiles and sizes as shown on drawings.

2.3 Fabrication

.1 Fabricate metal deck in accordance with requirements of CAN/CSA S136-89, Canadian Sheet Steel Building Institute (CSSBI) Standards and drawings.

.2 Fabricate steel deck with interlocking side laps.

.3 Fabricate to generally span over 3 or more supports unless shown otherwise on the drawings.

3. EXECUTION

3.1 Examination

.1 Before starting erection, take field measurements and examine other work which may affect this work.

.2 Notify the Engineer of any conditions which would prejudice proper installation of this work.

.3 Commencement of this work implies acceptance of existing conditions.

3.2 Damaged Members

.1 Repair or replace sections damaged during transit or erection, before securing in position.

3.3 Installation - General

.1 Erect metal deck in accordance with requirements of CSSBI and the drawings. Align and level deck on structural supports.

.2 Locate all end joints over supports.

.3 Lap all end joints on non-cellular deck 50 mm minimum or as indicated on plans.

.4 Maintain minimum end bearing on supports of 38 mm for deck up to 43 mm deep, 76 mm for 76 mm deep deck.

.5 Maintain minimum end bearing on masonry supports of 100 mm for deck up to 43 mm deep, 150 mm for 76 mm deep deck.

.6 Lay out lines of supporting members on top surface of deck to produce accurate attachment points or welds and prevent burns through deck from improper weld location.

.7 Cut all holes required in deck for drains, vents, mechanical equipment, ducts and conduits.

.8 Immediately after installation, touch up welds, burned areas and damaged areas of zinc coating with primer paint.

3.4 Metal Deck Installation

.1 Fasten roof deck to all supports with 20 mm diameter fusion welds at 300 mm o.c. maximum for both 150 and 200 mm modular decks. Mechanically fasten sidelaps at 900 mm o.c. by button punch or No. 8 self-tapping sheet metal screws.

.2 Fasten aluminum deck to all supports with gasketed stainless steel sheet metal screws at 300 mm o.c. maximum. Mechanically fasten side laps at 400 mm o.c. with No. 8 self-tapping sheet metal screws. Caulk each lap as specified.

.3 Install angle or channel closures full length on all deck edges at perimeter, walls and openings.

.4 Install deck to provide flat upper surface, with all flange surfaces touching a 1200 mm straight edge over structural supports.

.5 If 2 or more adjacent flanges on any deck section are concave or convex so that only edges or crowns touch straight edge, repair or replace deck sections.

END OF SECTION