PART 1 General

1.1 RELATED SECTIONS

.1	Cast-In-Place Concrete	Section 03 30 00
.2	Open Web Steel Joists	Section 05 20 00
.3	Steel Deck	Section 05 31 00

1.2 DESCRIPTION OF WORK INCLUDED

.1 Provide all labour, materials, equipment and services to supply and erect structural steel and open web steel joists required and/or indicated on the drawings or specified herein, including the supply of embedded steel parts which will form the connection between the structural steel and poured-in-place concrete and reinforcement of steel deck openings larger than 18 inches. Report any discrepancies between structural, mechanical, electrical and architectural drawings to the Contract Administrator immediately.

1.3 QUALITY ASSURANCE

.1 Structural steel work shall conform to the following standards:

.1 Provincial Building Code - current Edition.

.2 CSA Standard CAN/CSA-S16.1-01 (LIMIT STATES DESIGN OF STEEL STRUCTURES).

.3 CSA Standards CAN/CSA-W47.1-03 (CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES).

.4 CSA Standards W59-03 (WELDED STEEL CONSTRUCTION) (METAL ARC WELDING).

.2 Copies of the above publications shall be available from the Contractor at the job site at all times.

1.4 QUALIFICATIONS OF CONTRACTOR

.1 Structural steel fabricator shall have not less than five (5) years experience in the fabrication of structural steel.

.2 Erector shall have not less than five (5) years experience in erection of structural steel.

.3 The steel fabricators and erectors must be certified under the requirements of CAN/CSA W47.1 as required by CAN/CSA-S16-01.

.4 Welding procedures, welders and welding operations shall be qualified in accordance with Canadian Welding Bureau Standards.

1.5 SUBMITTALS & SHOP DRAWINGS

.1 Submit detailed erection and shop drawings prepared under the supervision of a Registered Professional Engineer in accordance with the General Conditions. Where pre-engineered or fabricator designed elements are part of the shop drawings, the shop drawings shall be stamped by a professional engineer licensed to practice in the applicable province.

.2 The shop drawings shall clearly show all shop and erection details, including cuts, copes, connections, holes, threaded fasteners, splices and welds. All welds, both shop and field, shall be indicated by AWS Welding Symbols as specified in CSA Standard W59 Appendix D and E.

.3 Provide setting drawings, templates and directions for the installation of anchor bolts plates and other devices.

.4 Prior to starting erection work, submit a description of the methods, sequence of erection and type of equipment proposed for in erecting structural steel.

.5 Joist drawings shall show joist eccentricity limits at maximum fabrication tolerances as described in the Open-Web Steel Joist Clause of CAN3-S16.1-04.

1.6 PRODUCT HANDLING

.1 Storage of Materials:

.1 Structural steel members shall be stored at the site above ground on platforms, skids or other devices.

.2 Steel shall be protected from corrosion.

.3 Other materials shall be stored in a weather tight and dry place until ready for use in the work.

.4 Packaged materials shall be stored in their original unbroken packages or containers.

1.7 SUPPLY OF ALTERNATE PRODUCTS

.1 Should the rolled sections shown on the drawings not be procurable from Canadian Mills, or should substitution for those sections be desired, sections of equivalent strength may be substituted if approved by the Contract Administrator. In such case full particulars thereof must be submitted prior to the closing of Bid. Material substitutions after the closing of Bid, if accepted, will be at the Contractor’s cost.

PART 2 Products

2.1 MATERIALS

.1 Structural Steel shall be in accordance with CSA Standard G40.21. Wide Flanges shall be Grade 350W, hollow structural sections shall be Grade 350W Class C, and steel plates and miscellaneous sections shall be 300W.

.2 Welding materials shall be in accordance with CSA Standard W59.

.3 Threaded fasteners to ASTM Specification A325 or A490.

.4 Anchor bolts to ASTM Specification A307 or better.

.5 Embedment anchors shall be Nelson headed anchors with fluxed ends or approved equal, in accordance with B6, conforming to ASTM. A.108-73.

.6 Bar anchors shall be Nelson deformed bar anchors or approved equal, in accordance with B6, conforming to ASTM.A-496.

.7 Brick support angles and related framing materials exposed to weather, shall be galvanized Z275 G90 designation.

.8 Primers for interior exposure not to receive a shop or field paint finish shall be CISC/CPMA Standard 1-73a Primer or other pre-approved, in accordance with B6.

.9 Primers for exterior exposure not to receive a shop or field paint finish shall be zinc chromate Type - 1, conforming to CGSB 1-GP-40d.

.10 Primers used in a multi-coat system where a final shop or field paint finish is to be applied shall be selected and pre-approved based on surface preparation, exposure conditions and compatibility with subsequent coatings.

.11 Steel Sunscreen: Galvanized to ASTMA 123; Provide a minimum 1.25 02/sq FT galvanized coating. Galvanize after all fabrication processes are complete including – welding, cutting, holes.

2.2 FABRICATION

.1 Unless otherwise indicated, fabrication of structural steel shall be in accordance with CSA Standard CAN/CSA-S16-01.

.2 Verify all dimensions and take necessary field measurements before fabrication.

.3 Provide punched holes for the convenience of other trades in attaching wood blocking or other materials. Coordinate with drawings of other disciplines for locations and details.

.4 Obtain Contract Administrator's approval for holes required through structural steel that are not shown on the drawings.

2.3 WELDING

.1 Appearance, quality of welds made, methods of correcting defective work shall be in accordance with CSA Standard W59.

.2 Prepare surfaces for welding either by leaving unpainted or remove paint.

.3 Embedded anchors, shear studs, and deformed bar anchors shall be automatically end welded with suitable stud welding equipment in accordance to the manufacturer's recommendations. Fillet welding of anchors will be rejected.

2.4 SHOP PAINTING

.1 Steel shall be painted with shop primer meeting the requirements of CSA Standard CAN/CSA-S16.1, unless noted otherwise.

.2 Architecturally Exposed Steel:

.1 Cleaning, preparation of steel and the paint product shall be compatible with requirements of finish painting.

.3 Use paint as prepared by manufacturer without thinning or adding admixtures. Execute painting on dry surfaces, free from rust, scale, and grease. Do not paint in temperatures lower than 8 deg. C.

.4 Interior structural steel - steel surfaces to be encased in concrete, welded, fireproofed, zinc coated, galvanized or to receive shear connector studs or embedment anchors shall not be painted.

.5 Clean contact surfaces by effective means before assembly, but do not paint.

.6 Where shop painting is required give two coats of paint (preferably of different colours) to parts inaccessible after final assembly.

.7 Touch-up welds, bolts, and burnt or scratched surfaces of painted steel after completion of erection.

2.5 COLUMNS AND BASES

.1 All flame cut steel columns shall have their ends milled. Steel base plates supporting columns shall be flat.

.2 Base plates and cap plates are to be seal welded to HSS columns.

2.6 CONNECTIONS

.1 Use connections of the type and detail shown on the drawings. Modifications to the specified connection types and details will not be permitted without prior approval from the Contract Administrator.

.2 Connections designed by the fabricator shall be in accordance with CSA Standard CAN/CSA-S16.1 and stamped and sealed by a Professional Engineer registered in the applicable province.

.3 All connections shall be designed to carry the loads specified on the drawings. If loads are not given, the connection shall have a capacity not less than the members being connected.

.4 Column to beam and girder connections shall allow for a horizontal stability force in all directions equal to 2% of the design column axial load in addition to all other loads.

.5 Structural steel members spliced for ease of fabrication or transportation shall have splices designed to develop the full strength and stiffness of the member. Splices shall be subject to non-destructive testing as directed by the Contract Administrator. The cost for such testing shall be done by the Contractor.

.6 Use standard connection types where possible.

.7 Provide stiffeners in beam webs at all locations of beam continuity. Unless noted otherwise web stiffeners shall be 12mm minimum.

.8 All bolted connections may be snug tight except connections for:

.1 Bracing, trusses and drag struts.

.2 Elements resisting crane loads.

.3 Supports for running machines or loads that produce impact or cyclic load.

.4 These shall be designed as slip resistant connections and pre-tensioned.

.9 Connections for lateral load resisting elements, bolts in tension, and elements connected with oversize or slotted holes unless designed to accommodate movement may be bearing connections but shall be pre-tensioned.

2.7 SEPARATORS AND MISCELLANEOUS SUPPORTS

.1 Provide separators for all double members in accordance with CSA Standard CAN/CSA-S16.1.

.2 Provide plates and/or angles for support of masonry where required.

2.8 ERECTION

.1 The erector is fully responsible for erection methods, equipment, workmanship and safety precautions.

.2 Erect structural steel plumb, true and with all necessary precautions against damage of any kind to the material and to the structure. Report every failure of members to come properly together and any measures taken for correction shall be submitted to the Contract Administrator for review.

.3 Confirm the setting of anchor bolts and bearing plates and make an instrument survey to verify the setting prior to erection of steel members.

.4 Cutting or burning of base plates to accommodate misplaced anchor bolts is not permitted.

.5 Provide and install temporary bracing as required to keep the structure plumb and in true alignment during construction. Assume complete responsibility for the extent and timing of the removal of such bracing. The bracing members indicated on the drawings are required for the finished structure and shall not be considered as adequate for temporary bracing. Any failure to make proper and adequate provision for stresses occurring during the erection from any causes whatsoever shall be entirely the responsibility of the Contractor.

.6 Structural steel frames shall be accurately assembled to the lines and elevations indicated within the specified tolerances.

.7 The various members forming parts of complete frame structure after being assembled shall be aligned and adjusted accurately before being fastened.

.8 Bearing surfaces and surfaces that will be in permanent contact shall be cleaned before the members are assembled.

.9 Temporary bolts, clips, and angles etc., used to facilitate erection shall be removed unless noted otherwise on the drawings.

2.9 TEMPORARY FLOORING

.1 Provide all temporary flooring, planking and scaffolding necessary in connection with erection of structural steel, or support of erection machinery in accordance with governing regulations or by-laws.

PART 3 Execution

3.1 COMPLETION

.1 The Registered Professional Engineer responsible for the sealed shop drawings or his representative shall visit the site to review the in place connections and components designed by that Registered Professional Engineer as required to substantiate the compliance with his sealed shop drawings. He shall then submit a letter of compliance provide a sealed and signed letter to the Contract Administrator.

.2 On completion of the work of this section, all protection erected in conjunction with the structural steel work shall be removed, all damage to this work and adjoining work shall be made good and all surplus materials and debris and all tools, plant and equipment shall be removed from the site.

3.2 FIELD QUALITY CONTROL

.1 Structural steel work (material and workmanship) shall be subject to review and testing by a testing agency retained by the City.

.2 Construction review by the testing agency or the Contract Administrator does not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with the drawings and specifications.

PART 1 General

1.1 RELATED WORK

.1	Cast-In-Place Concrete	Section 03 30 00
.2	Concrete Unit Masonry	Section 04 22 00
.3	Structural Steel	Section 05 10 00
.4	Steel Deck	Section 05 31 00

1.2 QUALITY ASSURANCE

.1 Open web steel joist shall conform to the following standards:

.1 Provincial Building Code - current edition.

.2 CSA Standard CAN/CSA-S16.1-01 (LIMIT STATES DESIGN OF STEEL STRUCTURES).

.3 CSA Standard CAN/CSA-S136-94 (COLD FORMED STEEL STRUCTURAL MEMBERS).

.4 CSA Standard CAN/CSA-W47.1-92 (CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES).

.5 CSA Standard W59-M03 (WELDED STEEL CONSTRUCTION) (METAL ARC WELDING).

.2 Copies of the above publications shall be available from the Contractor at the job site at all times.

1.3 DESIGN

.1 Design joists of the depth and spacing shown on drawings to carry specified loads in accordance with CAN/CSA-S16-01. Review Mechanical and Electrical drawings to insure all applicable equipment loads are included.

.2 Maximum deflection under live loads shall not exceed 1/360th of the span unless noted otherwise.

.3 Make allowance in joist design for passage of pipes, ducts, conduits, etc. Provide suitable reinforcing so as not to affect the strength of the joists or any part of the overall structure.

.4 Upon request by the Contract Administrator or Municipal Authority having jurisdiction, submit calculations and such further proof as may be necessary to shown that the steel joist construction conforms to the requirements set forth herein as well as the municipal building by-laws.

1.4 QUALIFICATIONS

.1 Steel joist fabricator shall have not less than five (5) years experience in the fabrication of steel joists.

.2 Erector shall have not less than five (5) years experience in erection of structural steel.

.3 The joist fabricators and erectors must be certified under the requirements of CAN/CSA W47.1 as required by CAN/CSA-S16-01.

.4 Welding procedures, welders and welding operations shall be qualified in accordance with Canadian Welding Bureau Standards.

1.5 SUBMITTALS

.1 Submit detailed erection and shop drawings in accordance with the General Conditions. Shop drawings shall be stamped by the Professional Engineer licensed to practice in the applicable province of the project. The Professional Engineer is responsible for the joist design and preparation of the shop drawings.

.2 The shop drawings shall clearly show materials, sizes, types, capacities, markings, spacing, cambers, bridging and quantities of joists. All welds, both shop and field, shall be indicated by AWS Welding Symbols as specified in CSA Standard W59, Appendix D and E.

.3 Indicate methods of connecting, anchoring, fastening, bridging, and attaching the work of other trades.

1.6 PRODUCT HANDLING

.1 Steel joists shall be handled at the job site in such a manner as to prevent bending or damage of the joist.

.2 Joists shall be stored at the site above ground on platforms, skids or other supports so that ground dampness will not affect the bottom joists of the stacks. Stacks of joists shall not be of such height as to cause bending in members near the bottom.

PART 2 Products

2.1 MATERIALS

.1 Structural steel shall be to CSA Standard G40.21.

.2 Welding materials shall be in accordance with CSA Standard W59.

2.2 FABRICATION

.1 Verify all dimensions and take necessary field measurements before fabrication.

.2 Fabricate joists to specified requirements and reviewed shop drawings.

.3 Joist members spliced for ease of fabrication shall develop the full strength and stiffness of the member.

.4 Where roof slopes are extreme and do not permit flush bearing of the steel deck on the joist top chords, provide continuous 3mm bent plates to the pitch as necessary to ensure full bearing of the steel deck. Coordinate with the deck supplier the locations that will require these bent plates.

.5 Architecturally exposed steel joists, related framing and bridging and exterior steel shall be painted.

.6 Interior steel joist surfaces to be encased in concrete, welded, fireproofed, zinc coated or galvanized shall not be painted.

2.3 WELDING

.1 Welding shall conform to the requirements of CSA Standard W59 and shall be undertaken by a fabricator certified by the Canadian Welding Bureau to the requirements of CAN/CSA S16.1.

2.4 CLEANING AND PAINTING

.1 Clean steel joists by scraping, wire brushing or other effective means, to remove loose scale, rust, oil and other foreign matter.

.2 Paint each joist before shipment with shop primer meeting the requirements of CAN/CSA-S16.1 applied either by dipping or spraying. Primer colour to be confirmed after award.

.3 Architecturally exposed joists shall be painted with shop primer meeting the requirement of CSA/CAN-S16.1. Cleaning, preparation of steel and the paint product shall be compatible with requirements of finish painting as specified in architectural finishes.

2.5 EXTENDED ENDS

.1 Provide extended ends of the joists as required and where shown.

.2 The extended ends shall have a load carrying capacity at least equal to the loads shown on the drawings.

.3 Provide bracing as required for lateral stability of bottom chords in compression.

2.6 WORKMANSHIP

.1 The steel joist work shall be executed by skilled and experienced workers in accordance with approved shop drawings and shall conform to drawings, details and specifications. The work shall be built square, true straight, accurate to sizes shown.

.2 Refer to Architectural drawings for extent and location of architecturally exposed joist elements.

.3 All open web steel joists and their bridging shall conform to the CSA Standard S16.1. Open web steel joists shall be of an approved manufacturer and shall conform to the specifications or the Steel Joists Institute unless otherwise noted.

.4 Remove and replace any work which is not acceptable to the Contract Administrator, when, and as directed. Such operation shall not become an extra charge to the City.

PART 3 Execution

3.1 ERECTION

.1 Coordinate with mechanical and electrical trades prior to erection of steel joists to ensure that the joists and bridging will not interfere with the installation of mechanical and electrical equipment.

.2 Erect joists and bridging in accordance to CSA-S16.1 and reviewed shop drawings.

.3 Support joists at 2 or more points during handling and erection.

.4 Provide temporary bracing to keep joists plumb and true in alignment during the erection.

.5 All construction loads shall be adequately distributed so as not to exceed the capacity of any joist or joists.

.6 Steel joists shall bear not less than 65mm on supporting steel members. Connect to supporting steel with a 5mm by 30mm long fillet weld at each side. Secure to bearing plates on masonry walls in the same manner, bearing 100mm minimum.

3.2 BRIDGING

.1 Bridging of steel joists shall be standard angle bridging conforming to the requirements of the CSA-S16.1. Angles for steel bridging shall not be less than 25 x 25 x 5mm.

.2 Where required for stability of bottom chord, additional bridging shall be provided. The stability requirements to be designed by the supplier using the loadings provided on the drawings. Refer to structural drawings for location of additional bridging.

.3 Architecturally exposed joist bridging and bracing shall be butt spliced and splices shall be ground smooth to receive finish painting as specified in Architectural Finishes. Lap splices in architecturally exposed bridging will not be permitted.

3.3 DAMAGED JOISTS

.1 Damaged joists shall not be used. Repair or replace all damaged joists to the satisfaction of the Contract Administrator.

3.4 COMPLETION

.1 The Registered Professional Engineer responsible for the sealed shop drawings or his representative shall visit the site to review the in place connections and components designed by that Registered Professional Engineer as required to substantiate the compliance with his sealed shop drawings. He shall submit a letter of compliance to the Contract Administrator to this effect.

.2 On completion of the work of this section, all protection erected in conjunction with the open web steel joist work shall be removed, all damage to this work and adjoining work shall be made good and all surplus materials and debris and all tools, plant and equipment shall be removed from the site.

3.5 FIELD QUALITY CONTROL

.1 Work (material and workmanship) shall be subject to review and tests by a testing agency retained by the City.

.2 Construction review in the field by the testing agency does not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with the drawings and specifications.

PART 1 General

1.1 RELATED SECTIONS

.1	Concrete Formwork	Section 03 10 00
.2	Concrete Reinforcement	Section 03 20 00
.3	Cast-in-Place Concrete	Section 03 30 00
.4	Structural Steel	Section 05 10 00

1.2 DESCRIPTION OF WORK INVOLVED

.1 Provide all labour, materials, equipment and services necessary to supply, fabricate, erect and install the steel deck and field welded shear connectors to structural steel as indicated on the drawings and as hereinafter specified. Provide 16 gauge metal form work at all deck edges for composite deck or concrete filled deck.

1.3 REFERENCE STANDARDS

.1 Structural Steel Deck shall conform to the requirements of the following standards (current edition) unless otherwise required by the specification:

.1 Current Edition of the Provincial Building Code

.2 CSA W47.1-1992 Certification of Companies for Fusion Welding of Steel Structures

.3 CSA W59-M03 Welded Steel Construction (Metal-Arc Welding)

.4 CSA S136-94 Cold Formed Steel Structural Members

.5 ASTM A446-76 Sheet Steel, Zinc-Coated (Galvanized) by the Hot Dip Process, Structural (Physical) Quality

.6 CSSBI 101M-78 Zinc Coated Structural Quality Steel Sheet for Roof and Floor Deck

.2 Where the standard is referred to in this specification it shall mean the documents specified in this clause.

.3 Copies of the above noted standards are to be made available by the contractor on site at all times.

1.4 QUALIFICATIONS

.1 All steel deck welders must possess current Canadian Welding Bureau Certificates of Qualification for light gauge structural welding.

.2 All deck fabricators must have full approval of the Canadian Welding Bureau under CSA W47.1-92 Division 1, 2.1, 2.2, or 3.

1.5 EXAMINATION

.1 Examine and verify all necessary measurements and dimensions of previously executed work that may affect the work of this contract.

.2 Examine surfaces where the work is to be placed on or against to ensure that they are square, true, level, plumb, of correct slope or shape and of proper surface to receive such work.

.3 Report any discrepancies to the Contract Administrator immediately so that instructions may be given for the necessary remedial work.

.4 Commencement of work shall be construed as acceptance of all conditions and surfaces.

1.6 SHOP DRAWINGS

.1 Submit shop drawings prepared under the supervision of a Professional Engineer registered in the province. Drawings of components designed by the fabricator shall be signed and sealed by the Registered Professional Engineer.

.2 Submit Shop drawings in accordance with General Conditions.

.3 Shop drawings shall show the position, extent, type and arrangement of the units, their relationship to other materials, depth, core thickness, coating thickness, connections, openings, and accessories.

PART 2 Products

2.1 GENERAL

.1 Products shall satisfy the requirements of the standard unless otherwise specified herein or on the drawings.

2.2 MATERIALS

.1 Steel deck shall be formed of zinc-coated sheet steel minimum Grade A with a base steel Nominal Thickness of 0.76mm or greater. The minimum zinc coating for interior exposure shall be ZF075 Wiped Coat and Z275 for exterior exposure. Steel deck to be acoustic where indicated on drawings.

.2 Cover plates, cell closures, and flashings shall be of the same materials as the deck with a minimum nominal thickness of 0.76mm.

.3 Deck shall conform to the depths and thicknesses shown on the drawings, or as designed by the contractor’s engineer for the loads and spans shown on the drawings.

.4 Insulation formed to fit flutes for acoustic deck. To be turned over to roof section for installation (075213)

2.3 FABRICATION

.1 Steel floor units shall be formed with integral locking lugs to provide mechanical lock between concrete and steel.

.2 Steel roof and floor units shall span over three or more supports unless prevented by the structural steel layout.

.3 Steel roof and floor units shall have interlocking male and female side laps.

.4 Provide cell closures at the open ends of all cell runs at columns, openings, walls, etc., and where cells change direction.

.5 For deck with concrete topping provide necessary metal gauge formwork at the deck edges for full deck and concrete depth to prevent leaking of concrete topping. This includes, but is not limited to, edges formed by building edges, openings framed by structural steel, elevator shafts, stairwells, mechanical openings and around webs and flanges of columns.

2.4 DESIGN

.1 All floor and roof deck to be designed by the fabricator to the reference standards unless otherwise noted.

.2 The deck gauge shall be designed to resist the loadings specified on the drawings.

.3 Gauges, spacing of puddle welds, type and extent of side connections shall be proportioned to resist diaphragm forces shown on the drawings, or be as designated on the drawings.

.4 The deflection under live load alone shall be limited to span/360 except for roof deck over areas that do not have suspended ceilings where deflection shall be limited to span/240.

.5 Decking to function as formwork must conform to W.C.B. formwork requirements.

PART 3 Execution

3.1 ERECTION

.1 The erection of the steel deck shall be carried out by erection forces of the deck manufacturer, or his appointed erector under the supervision and direction of the manufacturer.

.2 The steel deck units shall be placed on the supporting steel framework and adjusted to final position before being permanently fastened. Each section shall be brought to proper bearing. If the supporting framework is not in proper alignment or at the proper level, the Contractor shall so advise the Contract Administrator of such irregularities and shall not make final placement until corrections are made.

.3 All welding shall be undertaken by a fabricator fully approved by the Canadian Welding Bureau to the requirements of CSA Standard W47.

.4 Immediately after the steel floor units are welded in place, the steel floor surface shall be inspected, and all areas where zinc coating has been burned by welding shall be covered by zinc enriched paint, applied to the paint manufacturer's instructions.

.5 Steel deck to be welded to the supporting steel with 20mm puddle welds at 300mm maximum centres at all bearing points and at 150mm maximum centres at building edge, unless otherwise noted on drawings.

.6 End laps shall not be less than 50mm and must be formed over supports.

.7 All deck side laps shall be button punched, mechanically fastened or welded at 600mm maximum centres, unless otherwise noted on drawings.

.8 Cut all openings in metal decking at locations shown on the project drawings. These openings shall be located and dimensioned in co-operation with the various trades at the time of erecting the steel deck. Openings up to 450mm in size shall be reinforced by this trade, using steel angles sized to carry the specified loads and welded across the flutes and bridging to two flutes for every flute cut.

.9 The Contractor shall accommodate the erection and welding sequence of the structural steel as required.

3.2 FLASHING AND CLOSURES

.1 Furnish, install and weld in position, sheet metal flashings to close openings between deck sections and columns and to cover gaps where deck sections abut or change direction.

.2 For deck with concrete topping install all light gauge metal closures and edge strips necessary as formwork for the concrete.

3.3 CLEAN UP

.1 All steel deck cuttings, strapping, packaging material and other debris pertaining to steel deck units shall be cleaned up on the floor area each working day.

.2 Remove all debris and excess material at completion of erection of steel deck and leave work ready for other trades. Repair any defects to this work or any other defects caused by this work. Leave steel deck including underside of roof deck free of all oil, grease and dirt.

3.4 SUBMISSION

.1 Submit upon Tender acceptance the following data to substantiate compliance with specified design and performance requirements.

.2 Details of proposed steel deck units, including profiles and dimensions.

.3 Design calculations and test data on proposed steel deck units, signed and sealed by a Registered Professional Engineer experienced and qualified in this type of work.

Part 1 General

1.1 SECTION INCLUDES

.1 Shop fabricated ferrous metal items galvanized and prime painted.

.2 Steel stair frame of structural sections, with risers, stair treads and landings.

1.2 RELATED SECTIONS

.1 Section 03 30 00 - Cast-In-Place Concrete: concrete filled pan treads.

.2 Section 05 10 00 - Structural Steel.

.3 Section 05 20 00 - Open Web Steel joists.

.4 Section 06 20 00 - Finish Carpentry

.5 Section 09 90 00 - Painting: Paint finish.

1.3 REFERENCES

.1 ANSI A14.3 - Ladders, Fixed, Safety Requirements.

.2 ASTM A36 - Structural Steel.

.3 ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.

.4 ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.5 ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.6 ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.7 ASTM A283 - Carbon Steel Plates, Shapes, and Bars.

.8 ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

.3 Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.5 QUALIFICATIONS

.1 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

Part 2 Products

2.1 MATERIALS - STEEL

.1 Steel Sections: ASTM A36. .

.2 Plates: ASTM A283 .

.3 Pipe: ASTM A53, Grade B Schedule 40 .

.4 Bolts, Nuts, and Washers: ASTM A307.

.5 Welding Materials: Type required for materials being welded.

.6 Ladders: ANSI A14.3.

.7 Shop and Touch-Up Primer: red oxide.

2.2 FABRICATION

.1 Fit and shop assemble items in largest practical sections, for delivery to site.

.2 Fabricate items with joints tightly fitted and secured.

.3 Delete the following paragraph if noted on drawings.

.4 Continuously seal joined members by continuous welds.

.5 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

.6 Weld and form edges, ends, and joints smooth. Grind welds of stainless steel smooth and flush; polish to match adjacent surfaces.

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

.8 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 FABRICATION - PAN STAIRS AND LANDINGS

.1 Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.

.2 Form treads and risers with minimum 3.4 mm thick sheet steel stock.

.3 Secure reinforced tread pans to stringers with clip angles ; welded bolted in place.

.4 Form stringers with rolled steel channels.

.5 Form landings with minimum 3.4 mm thick sheet stock. Reinforce underside with angles to attain design load requirements.

.6 Form balusters as noted on drawings welded to stringers.

.7 Prime paint components.

2.4 FABRICATION TOLERANCES

.1 Squareness: 3 mm maximum difference in diagonal measurements.

.2 Maximum Offset Between Faces: 1.5 mm.

.3 Maximum Misalignment of Adjacent Members: 1.5 mm.

.4 Maximum Bow: 3 mm in 1.2 m.

.5 Maximum Deviation From Plane: 1.5 mm in 1.2 m.

2.5 FINISHES - STEEL

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

.2 Do not prime surfaces in direct contact with concrete or where field welding is required.

.3 Prime paint items with one coat.

.4 Structural Steel Members: Galvanize after fabrication to ASTM A123. Provide minimum 380 g/sq m galvanized coating.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

.1 Clean and strip primed steel items to bare metal and aluminum where site welding is required.

.2 Do not embed aluminum products into cementitious materials due to inevitable corrosion deterioration.

.3 Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

.1 Install items plumb and level, accurately fitted, free from distortion or defects.

.2 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

.3 Field weld components indicated on shop drawings.

.4 Obtain approval prior to site cutting or making adjustments not scheduled.

.5 After erection, prime welds, abrasions, and surfaces not shop primed except surfaces to be in contact with concrete.

.6 Coordinate work with Section 06 20 00.

3.4 ERECTION TOLERANCES

.1 Maximum Variation From Plumb: 6 mm per story, non-cumulative.

.2 Maximum Offset From True Alignment: 6 mm.

.3 Maximum Out-of-Position: 6 mm.

3.5 SCHEDULE

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

.2 Schedule each fabrication separately. Describe items, size, shape, materials, finish, and other relevant information.

.3 Roof ladders: Steel as detailed; prime paint finish.

.4 Roof hatch ladders: Steel as detailed; prime paint finish

.5 Guard Rails: As detailed; prime paint galvanized finish.

.6 Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

.7 Ledge and Shelf Angles, Not Attached to Structural Framing: For support of masonry ; galvanized finish.

.8 Lintels: As detailed; galvanized finish.

.9 Door Frames for Overhead Door Openings: Angle sections; prime paint finish.

.10 Vanity brackets; as detailed; prime paint finish.

.11 Accordion partition support framing; prime paint.

.12 Fixed bench brackets and bench pedestals: as detailed - prime paint.

.13 Home improvement bench support; as detailed - prime painted.

.14 Ceiling hung shelving supports: as detailed - prime painted; located in room 128.

END OF SECTION