

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        The list of work sections in this division is indicative and non-exhaustive. It does not exclude the works described in the other specification sections, shown in the drawings or necessary for the execution of the works in keeping with overall intent of the plans.
- .2        Section 01 33 00 – Submittal Procedures.
- .3        Section 01 61 00 – Common Product Requirements.
- .4        Section 01 74 11 – Cleaning.
- .5        Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

**1.2                SCOPE OF WORK**

- .1        Provide labour, equipment and material required to fabricate and install on site all the metal decking required in the plans.
- .2        Provide and install all the accessories required for the decking.
- .3        Cut open all holes larger than 150 mm, with reinforcement.
- .4        Cut open all holes smaller than 150 mm, without reinforcement.

**1.3                REFERENCE CODES AND STANDARDS**

- .1        Unless otherwise indicated, the most recent editions of all reference standards must be used.
- .2        Design, fabrication and installation must comply with S136 and S136.1 standards.
- .3        Unless otherwise indicated, work to be done in accordance with recommendations of « Standard for Steel Roof Deck » and « Standard for Composite Steel Deck » published by the Canadian Sheet Steel Building Institute (CSSBI).
- .4        Unless otherwise indicated, perform welding work in compliance with W59 standard.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit documents/samples in accordance with Section 01 33 00 - *Submittal Procedures*.

- .2 Product Data :
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for steel decking and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings :
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada.
  - .2 Upon request by Departmental Representative, submit design calculations.
  - .3 Shop drawings must indicate, show or include the plan, profile and dimensions of decking, thickness of base steel material, designation of metallic coating, projections, openings, fasteners and their spacing, details and accessories.
  - .4 For concrete covered deck, if called for on plans, shop drawings must indicate, show or include relevant temporary deck shoring details such as shoring location, time of their placement and removal along with expected duration of each of these operations.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - *Common Product Requirements* and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements :
  - .1 Store materials off the ground in clean, dry and well-ventilated area, in accordance with manufacturer's recommendations.
  - .2 Store and protect decking from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging waste Management: remove for reuse and return by manufacturer of packaging materials accordance with Section 01 74 21 - *Construction/Demolition Waste Management and Disposal*.

## **Part 2 Products**

### **2.1 DESIGN CRITERIA**

- .1 Design, fabricate and install steel deck to S136 and S136.1.
- .2 Unless otherwise indicated, execute the work in compliance with the recommendations for steel roof decks and steel composite decks published by the Canadian Sheet Steel Building Institute (CSSBI).

- .3 Unless otherwise indicated, execute the welding work in compliance with the W59 standard.
- .4 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.

## 2.2 MATERIALS

- .1 Sheet Steel : Compliant with the ASTM 101M standard of the Canadian Sheet Steel Building Institute and galvanized, except if otherwise indicated in the plans, as specified in the ASTM A525 standard, with zinc coating 275 g/m<sup>2</sup>.
- .2 Acoustic insulation : fiber glass 17.5 kg/m<sup>3</sup> density minimum profiled to suit deck flutes (when acoustic deck is required in the plans).
- .3 Soundproof closing material : Closed cell foam rubber that follow the shape of the deck, 25 mm thick.
- .4 Cover plates, flute closures and flashings : steel sheet with minimum base steel thickness of 0.76 mm minimum. Metallic coating same as deck material.
- .5 Nails must be ribbed; have a steel washer minimum ½" in diameter; be zinc electroplated in accordance with ASTM B633, sc.1, Type III; meet SDI and CSSBI design requirements and be Factory Mutual approved such as Hilti.
  - .1 Fasteners: Hilti ENP2H-21-L15 or approved equivalent product for fastening to steel beams and X-EDNK22-THQ12-HSN / X-EDN19-THQ12-HSN / ENP2K-20-L15 or approved equivalent product for fastening to steel joists steel or cold formed sections (flange thickness 3-10 mm).
  - .2 Deck to deck fastening (longitudinal side lap deck joint) :
    - .1 Do longitudinal side lap joint by overlapping deck sheets and fastening with screws which :
      - .1 Have a shear capacity of at least 1 kN in the deck thickness specified on plans.
      - .2 Are adequate type of screw for use with thickness of deck to be fastened.
    - .2 The maximum spacing of screws in longitudinal side lap joints is 300 mm c / c.
- .6 Shear studs : to CSA W59.
- .7 Acceptable materials or products : When materials or products are specified by their brand names, refer to bidders instructions for procedure on how to submit equivalent/substitution product or material for approval.

## 2.3 TYPES OF DECKING

- .1 Steel deck according to thickness and model specified on plans.

**Part 3 Execution**

**3.1 EXAMINATION**

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

**3.2 INSTALLATION**

- .1 Steel deck related work : in accordance with CSA S136 and CSA S136.1.
- .2 Welding : in accordance with CSA W59, except if specified otherwise.
- .3 Welding companies to be certified under Division 1 of present specifications or according to clause 2.1 of CSA W47.1 standard for fusion welding of steel and/or CSA W55.3 for resistance welding.

**3.3 ERECTION**

- .1 Install the steel deck as indicated and according to manufacturer's instructions.
- .2 Overlap sheet ends at least 50 mm over supports.
- .3 Where conditions allow, the deck must be continuous over at least three (3) spans.
- .4 If required on plans, weld shear stud connectors through steel deck to steel beams underneath and test welds, in accordance with CSA W59.
- .5 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.
- .6 Prior to concrete placement, steel deck to be free of soil, debris, standing water, loose mill scale and other foreign matter.
- .7 Temporary shoring, if required, must 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.
- .8 Place and support reinforcing steel as indicated.

### **3.4 DECK FASTENING**

- .1 Unless otherwise indicated on plans, fasten deck using nails :
  - .1 Hilti ENP2H-21-L15 or approved equivalent product for fastening to steel beams.
  - .2 Hilti X-EDNK22-THQ12-HSN / X-EDN19-THQ12-HSN / ENP2K-20-L15 or approved equivalent product for fastening to steel joists steel or cold formed sections (flange thickness 3-10 mm).
- .2 Use equipment and methods recommended by nail manufacturer. Conduct tests to adjust to optimum power. During installation, regularly check the quality of nail penetration. To ensure proper alignment above supports, especially above steel joists, mark reference lines on deck. Correct procedure, if necessary, and redo loose nails. In winter, keep nails warm.
- .3 In the absence of fastening pattern on plans, use the following fastening procedure :
  - .1 Use one nail at all flutes above each support perpendicular to deck ribs.
  - .2 Use one nail every 300mm on center maximum on spandrel beams and beam on bracing gridlines parallel to deck ribs. Use additional intermediate shear transfer elements when necessary.
  - .3 Run longitudinal side lap joints by overlapping sheets and fastening with Hilti S SLC 01 M HWH or S-SLC 02 M HWH or approved equivalent product; 300 on center.

### **3.5 POUR STOP AND EDGE ANGLES**

- .1 Unless otherwise indicated, when the metal deck acts as formwork for a concrete slab, provide and install all of the pour stops and angles necessary to contain the concrete inside the deck and formworks during pouring, specifically on the outside perimeter, around the openings and perforations.
- .2 Use steel angles, 6 mm thick minimum.
- .3 If required, support the vertical leg with strips acting as ties.
- .4 The horizontal leg must be supported on a minimum width of 50 mm.
- .5 The height of the vertical leg must match the total thickness of the slab and deck.

### **3.6 OPENING REINFORCEMENTS**

- .1 No reinforcement required for openings cut in deck which are smaller than 150 mm.
- .2 Frame deck openings with any one dimension between 150 to 300 mm as recommended by manufacturer, except as otherwise indicated.

**3.7 ACCESSORIES INSTALLATION**

- .1 Install deck accessories in compliance with CSSBI and as indicated.

**3.8 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - *Cleaning*.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - *Cleaning*.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - *Construction/Demolition Waste Management and Disposal*.

**3.9 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by steel decking installation.

**END OF SECTION**