

Part 1 General

1.1 SECTION INCLUDES

- .1 Fall arrest anchors

1.2 RELATED REQUIREMENTS

- .1 Section 05 12 23 – Structural Steel for Buildings, for cross tube and U-bolts
- .2 Section 05 21 00 – Steel Joists
- .3 Section 07 52 00 – Modified Bituminous Membrane Roofing

1.3 REFERENCES

- .1 CSA International (CSA)
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
 - .2 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel
 - .3 CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum
 - .4 CSA W59-03, Welded Steel Construction (Metal Arc Welding)
 - .5 CAN/CSA-Z91-02, Health and Safety Code for Suspended Equipment Operations
 - .6 CSA Z259 Series: Design of Active Fall-Protection Systems, Fall Arresters, Vertical Lifelines and Rails, Flexible Horizontal Lifeline Systems, Design Requirements, Testing Requirements, and Testing
- .2 Province of Manitoba
 - .1 Manitoba Workplace Safety and Health Regulation 217/2006, Part 14 Fall Protection

1.4 ADMINSTRATIVE REQUIREMENTS

- .1 Coordinate with installation of roofing assembly to provide continuous waterproof protection.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for roof anchors and safety restraints and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
 - .1 Show layout, profiles and product components, including anchorage, accessories and finish, along with arrangement of anchors and working positions.
 - .2 Include erection drawings, elevations, roof layout indicating location and spacing of anchors, and detail drawings of securement to structure, and design details.
 - .3 Indicate loads imposed on building structure.
 - .4 Include installation and rigging instructions and restrictive and non-restrictive working usage notes, and general safety notes.
 - .5 Indicate welded connections using standard welding symbols include net weld lengths.

1.6 SUBMITTALS FOR INFORMATION

- .1 Submit Test Reports and substantiating engineering data and test results of previous tests by independent laboratory which purport to meet performance criteria, and other supportive data.
- .2 Delegated-Design Submittal: For installed products to comply with performance requirements and design criteria, including structural calculations, analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- .3 Certificates: provide catalogued or published ratings obtained from tests carried out by manufacturer or those ordered from independent testing agency signifying adherence to codes and standards.

1.7 CLOSEOUT SUBMITTALS

- .1 Submit operation and maintenance data in accordance with Section 01 78 00 – Closeout Submittals. Include:
 - .1 Methods for maintaining installed products.
 - .2 Precautions against cleaning materials and methods detrimental to finishes and performance.
 - .3 Visual information indicating proper procedures in the usage of the system, inspection and maintenance requirements.

1.8 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Welder's qualifications: welders certification to CSA W55.3
 - .1 Employ qualified and licensed welders possessing certificates for each procedure to be performed.
 - .2 Each welder to possess identification symbol issued by authority having jurisdiction.
 - .2 Welding company certification: certified for fusion welding of steel structures to CSA W47.1
 - .3 Manufacturer Qualifications: company specializing in manufacturing products specified in this section with minimum three years documented experience.
 - .4 Installer Qualifications: manufacturer's authorized and trained personnel, with minimum five years' experience installing fall protection systems similar to those specified.
 - .5 Comply with applicable requirements of laws, codes, ordinances and regulations of authorities having jurisdiction. Obtain necessary approvals from such authorities.

1.9 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

Part 2 Products

2.1 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Fall arrest safety anchors, including steel ropes and loops, and attachments: designed to a maximum fall arresting force of typically 8.0 kN when wearing a body harness with a safety factor of 2 without any permanent deformation and to 24 kN against fracture or detachment applied in the most adverse direction.
- .2 System connectors: meet or exceed applicable CSA Z259 standards.

2.2 MATERIALS

- .1 Steel Sections and Plates: CSA G40.20M/G40.21.
- .2 Stainless Steel Tubing and Plates: Type 304.
- .3 Steel Rings: Forged stainless steel, ring thickness determined by imposing loads.
- .4 Bolts, Nuts, and Washers: stainless steel.
- .5 Gaskets under Anchors: neoprene pads, compatible with roof membrane, cut to size.
- .6 Welding materials: CSA-W47.1 for materials being welded.

2.3 SAFETY TIEBACK ANCHORS

- .1 Roof-Mounted Anchors: to CSA Z91, type 304 stainless steel forged eye, for means of attaching suspension wire rope or safety lifeline, welded to urethane-insulated hot-dip galvanized Type 300W HSS post complete with welded baseplate, under-joist plate, and four stainless steel bolts, lock washers and nuts for bolting around OWSJ. HSS post length to extend 300 to 450 mm above roof deck to suit insulation thickness. Provide seamless spun aluminum flashing for weatherproof installation, complete with bituminous painted deck flange for installation in modified bituminous membrane roofing.
 - .1 Manufacturers/Products:
 - .1 Thaler; FARA 16U.
 - .2 Pro-Bel Safety and Tie-Back Anchors.

2.4 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 Continuously seal joined members by intermittent welds and plastic filler.
- .4 Grind exposed joints flush and smooth with adjacent finish surface.
 - .1 Make exposed joints butt tight, flush, and hairline.
 - .2 Ease exposed edges to small uniform radius.
- .5 Exposed Mechanical Fastenings: screws or bolts; consistent with design of component.
- .6 Furnish and install components required for anchorage of fabrications.
- .7 Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.5 FABRICATION TOLERANCES

- .1 Squareness: 3 mm maximum difference in diagonal measurements.
- .2 Maximum Deviation from Plane: 1.5 mm from 1 m.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine surfaces and areas upon which the work of this section depends. Report defects of work prepared by other trades and other unsatisfactory site conditions, which would cause defective installation of products, or cause latent defects in workmanship and function.
- .2 Verify site dimensions.
- .3 Verify dimensions, tolerances, and method of attachment with other work.

3.2 PREPARATION

- .1 Supply and install steel items required to be attached to steel framing as clean uncoated metal, with setting templates to appropriate sections.

3.3 ERECTION TOLERANCES

- .1 Maximum Variation from Plumb: 3 mm.

3.4 INSTALLATION

- .1 Install anchors and equipment in accordance with manufacturer's printed instructions, shop drawings and as specified.
- .2 Install work under direct supervision of a professional engineer.
- .3 Where necessary, provide protection against deterioration due to contact of dissimilar materials.
- .4 Bolted fastening:
 - .1 Minimum two threads to be exposed.
 - .2 Positively lock nut by deforming threads, welding, pinning or equivalent method.
- .5 Ensure work is inspected prior to application of roofing.
- .6 Install items plumb and level, accurately fitted, free from distortion or defects.
- .7 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .8 Field weld components as indicated on shop drawings. Perform field welding.
- .9 Place flashing sleeve over base and seal to roof membrane in accordance with manufacturer's instructions. Flash in deck flange with two overlapping layers of membrane and seal with asphalt sealer.
- .10 Obtain approval from Contract Administrator prior to site cutting or making adjustments not scheduled.

3.5 FIELD QUALITY CONTROL

- .1 After the safety system is installed, the system manufacturer's approved authorized representative shall inspect and operate the system and shall make all final adjustments for proper operation.
- .2 Certify and test each component in accordance with requirements of CSA Z259 Series.
- .3 Complete "Initial Inspection – Certification for Use" form included in Equipment Manual & Inspection Log Book.

3.6 ADJUSTING

- .1 Verify manufactured units have been installed in accordance with specifications and details, and function as intended.
- .2 Adjust items where necessary to ensure proper operation.
- .3 Provide necessary documentation certifying system is acceptable for service.

3.7 CLEANING

- .1 Clean units using materials and methods approved by manufacturer. Do not use cleaners or techniques which could impair performance of the roofing system.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by roof anchors and safety restraint installation.

3.9 OPERATOR TRAINING

- .1 Provide demonstration and training in accordance with Section 01 79 00 – Demonstration and Training.

END OF SECTION