

INSTALLATION OF FALL ARREST SYSTEMS

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SECTION 1 – GENERAL REMARKS

1.1 Preamble

This specification covers the installation of anchor points to be used for all work performed around the roof edge.

1.2 Scope of Work

- .1 The contractor shall supply the know-how, products and materials, equipment, tools, labour and services required to complete the work shown in the plans and described in this section.
- .2 The work described in this section covers the installation of anchor points used as fall arrest systems for worker safety, on various areas of the roof:
 - .1 To supply and install 9 anchors bases fixed to concrete structure with epoxy adhesive to concrete slab (see installation detail type 4). These anchors will be connected by a horizontal cable with energy absorber. (See horizontal cable detail;
 - .2 To modify the following existing anchor bases: #AC-33 (T1)-2008, AC-37 (T-1)-2008, AC-38-(T1)-2008 and AC-41 (T1)-2008. Add the horizontal cables with energy absorbers as indicated on the plan;
 - .3 To supply and install the new equipment of type 2 and 3 and a horizontal lifeline system provided with energy absorbers as described on the plan. The horizontal lifeline system shall be provided as a continuous line with 2 trolleys allowing the user to reach the intermediate anchors without any specific manipulation. This horizontal lifeline shall be approved by the contractor's engineer.
 - .4 To supply and install the new anchor of type 4 and the accessories described on the plan. These accessories include a retractable lanyard and a retractable pole provided with an adaptor allowing the user to attach a lanyard to an anchor point located overhead. The contractor shall ensure the compatibility of these two elements. Equivalence is acceptable with the approbation of the project engineer.
 - .5 The contractor shall also carry out all other work required for the complete execution of the work according to standards and references recognized in the industry. This has to be done even if it is not mentioned in this specification or shown on the drawings.

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- .6 The contractor shall provide through his engineer, a protocol for the testing of the anchors, which will include the method that will be used and the load that will be applied. This protocol will be coordinated with the project engineer. Once accepted, the contractor will proceed to the loading tests on anchors, under the responsibility of his engineer and will submit a report following the tests.
- .7 Identify the anchors according to the CSA-Z259.15.12 standard.
- .8 To provide a complete one year warranty on the system

1.3 Timetable

- .1 The work in this section shall be coordinated with the related work.
- .2 The contractor shall submit a timetable before work begins.

1.4 References to Standards

- .1 National Building Code-Canada 2010
- .2 Quebec Construction Code (2010)
- .2 Safety Code for the construction industry
- .3 CSA Z259-16-04(2009), Design of Active Fall-Protection Systems
- .4 CSA Z259-13-04(2009) Flexible Horizontal lifeline systems
- .5 CSA Z259-15-12 Anchorage Connectors
- .6 CAN/CSA-S16-09, Limit States Design of Steel Structures
- .7 CSA A23.3-14 Design of Concrete Structures
- .8 CSA W47.1-[F92(C2001)], Certification of Companies for Fusion Welding of Steel

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1.5 Cleaning

- .1 Clean metal structures after their installation, in order to remove dust created by the construction work or by the surrounding environment.
- .2 Once the work has been completed, dispose, off-site, the extra materials, waste, tools and barriers used to protect the equipment.
- .3 Clean work and circulation areas daily.

SECTION 2 - TECHNICAL SPECIFICATION

2.1 Materials

- .1 Construction steel: in compliance with standards CAN/CSA-G40.20/G40.21, grade 300W/350W
- .2 Materials of the following types: galvanized steel, stainless steel and aluminum
- .3 Bolts, nuts and washers: in compliance with standard ASTM A325
- .4 Welders and welding firm: in compliance with standards W47.1 and W47.2.
- .5 Welding materials: in compliance with standards CSA W59 and CSA W59.2 as approved by the Canadian Welding Bureau.
- .6 Hot galvanizing by immersion: as indicated, galvanized steel elements in compliance with standard CAN/CSA-G164, with zinc coating of at least 600 g/m².
- .7 Grout: non-shrink, non-metallic, fluid, with strength of 25 MPa after 24 hours

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2.2 Anchors to the Structure

This section refers to the plans and concerns all anchors.

- .1 End cable anchors are designed with loads of 5000 lb in the cable axis and 3600 lb in the potential falling direction, which means perpendicular to the cable.
2. The intermediate anchors are designed with loads 3600 lb in the falling direction, which means perpendicular to the cable.
- .3 The individual anchors are designed with a load of 1800 lb in the falling direction.
- .3 Hot-galvanized 350W steel anchors.
- .4 Visible welds must be continuous over the length of the joint; they must be filed off or grounded, in order to present a smooth, uniform surface.
- .5 To Fill bases with insulating wool.
- .6 On-site modifications or cutting of any structural element must be approved in advance by Service d'ingénierie Jean Massé.

2.3 Shop Drawings

- .1 Shop drawings must indicate or show the materials, web thickness, finishes, assemblies, joints, anchoring method and number of anchor devices, supports, reinforcing elements, connection details and accessories. The contractor shall supply three copies of these documents for approval.
- .2 Submit shop drawings showing all construction and assembly details of the project.
- .3 Shop drawings shall bear the seal and signature of a recognized engineer who is a member in good standing of the Ordre des ingénieurs du Québec. The engineer shall have at least five years' experience in this field.
- .4 Submit utilisation plans and utilisation instructions showing the maximal number of workers on the system, the type of fall protection equipment compatible with the system and all other required notes

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2.4 Installation

- .1 Anchors will be installed by the trade responsible for the work in this section.

SECTION 3 – SPECIFIC SITE CONDITIONS

3.1 Temporary Waterproofing

- .1 The contractor shall provide a method for temporarily waterproofing openings in case of sudden rain.

3.2 Protection for On-Site Welding Work

- .1 All necessary on-site protections shall be provided, so that no damage is caused to the premises or to equipment and materials on the work site or related sites. No welding may be carried out in the ceiling space or on the roof, excepting for the case mentioned at point 3 of this present section.
- .2 The necessary protective measures shall be taken against risks of damage from sparks, smoke or any other cause related to welding work.
- .3 If a temporary welding shop is set up on the roof or elsewhere, the contractor shall submit, in writing, the work method to be used and a description of the setup for approval. In such cases, the shop will have to contain the appropriate extinguishers.

3.3 Fall protection during the work

- .1 The Contractor is responsible to submit a working method for the work executed within a distance of 3 meters to the roof edge.

