

SECTION 11014
FALL ARREST EQUIPMENT

PART 1-GENERAL

1.01 PROVISIONS INCLUDED

- A. The general provisions of the Contract, including General and Supplementary General Conditions, and Division 1 General Requirements, apply to work specified in this Section.

1.02 SUMMARY

- A. Work of this section includes the design, supply and installation of fall arrest equipment for building exterior.
1. Architectural plans show selected details and proposed equipment locations to indicate general concept. Final design and engineering of the system is the responsibility of the equipment manufacturer.
- B. Related Work Specified in Other Sections:
1. Concrete fill on metal roof deck: Section 03310, "Cast-in-Place Concrete."
 2. Structural steel: Section 05120.
 3. Steel roof deck: Section 05310.
 4. Flashing of davit bases: Section 07540, "Thermoplastic Polyolefin (TPO) Membrane Roofing."

1.03 SUBMITTALS

- A. Product Data: Manufacturer's technical data and installation instructions.
1. Provide handling, installation instructions, anchorage information, roughing-in dimensions, templates and service requirements.
- B. Submit shop drawings showing complete layout and configuration of system, equipment locations, rigging, and all other components and accessories.
1. Include installation and rigging instructions, working usage notes, and general safety notes.
 2. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation; or have the shop Drawings and calculations reviewed by a professional engineer registered in the State of Maine.
- C. Provide a safety inspection log book for yearly inspections.

1.04 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A professional engineer registered in the State of Maine and who is experienced in providing engineering services of the kind indicated. Engineering

services are defined as those performed for installations of fall arrest systems that are similar to those indicated for this Project in material, design, and extent.

- B. Fabricator Qualifications: A firm experienced in producing equipment similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.05 REFERENCE STANDARDS

- A. Design a fall arrest system in accordance with the following standards;
 - 1. Federal OSHA standard 1910.66, subpart D (Walking and Working Surfaces)
 - 2. Appendix C to 1910.66 Personal Fall Arrest Systems.
- B. Comply with the requirements of the AISC publication: "Load and Resistance Factor Design Specification for Structural Steel Buildings", the AISI publication: "Specification for Design of Cold-Formed Steel Structural Members (1986 & 1989 Addendum)".
- C. Welding: Comply with "AWS D1.1 "Structural Welding Code-Steel" and require welding to be performed by welders qualified to work in the state of Maine.

1.06 COORDINATION

- A. Carefully review architectural and structural Drawings to determine if all requirements for fall-arrest system are met. Submit drawings which clearly indicate where supplementary steel will be required that is not shown on Structural Drawings. Indicate required forces that will need to be resisted. Inform Architect in writing of additional requirements for other trades that do not appear on Contract Documents.
- B. Roof anchor locations and quantity are shown on the architectural Drawings only to indicated architectural design intent and to inform roofing subcontractor of approximate scope of required flashing. Actual quantity and locations of anchors shall be determined by the fall arrest system manufacturer's Professional Engineer.

PART 2-PRODUCTS

2.01 MANUFACTURER

- A. Manufacturer: Fall arrest systems of the type specified are available from the following manufacturers:
 - 1. PROBEL, The Safety Roof Anchor Company; 800-461-0575 (Basis of Specification).
 - 2. American Anchor; Foxboro, MA; 800-871-8221
 - 3. Diversified Fall Protection, Inc., Cleveland, OH; 216-265-2862
 - 4. Fall Protection Systems, Inc., Florissant, MO; 877-972-0400.
 - 5. Trittech Fall Protection Systems; 403-287-1499.

2.02 TIE BACK LIFELINE ANCHORS

- A. Anchoring system shall be capable of resisting with out fracture or pull out with a force of 5,000 lbs. applied in any direction

- B. Safety Anchoring Eye: Stainless steel or other corrosion resistant material; not less than 3/4 inch diameter, with an eye opening not less than 1.5 inch diameter. Bolts and connecting hardware shall be made of stainless steel or hot dipped galvanized material.
 - C. Steel Bases: Hot dipped galvanized mild steel.
 - D. Anchor Studs:
 1. Single insert anchor stud securement bolt: Stainless steel.
 2. Multiple cast in place anchors studs: Hot dipped galvanized mild steel.
 - E. Drilled Concrete Anchors: Adhesive epoxy anchors manufactured by U-Pat or Hilti. Do not use mechanical fasteners. If adhesive securement is considered, 100% of the inserts shall be tested at 5,000 lbs.
 - F. Flashings for metal roof anchors: Spun aluminum, seamless.
- 2.03 HANDS FREE HORIZONTAL CABLE LIFE LINE SYSTEM
- A. System Description: Hands free horizontal life line system which allows the worker to walk freely along the system with the lanyard and allows a lanyard to pass through the intermittent brackets.
 - B. Provide a system designed with fall arrest system (FAS) capability, as follows:
 1. Limit the total vertical free fall distance to a maximum of 6 feet or less.
 2. Ensure a user is not exposed to maximum arrest for (MAF) in excess of 1,800 lbs.
 3. Include all hardware, two lanyards attached to the horizontal life line system, and body harnesses.
 - C. Design anchor components to provide an adequate attachment means suited to current fall arrest practices and compatible with industry standard equipment. Ensure that anchor component design conforms to proper engineering principles.
 - D. Horizontal Cable: 1/2 inch diameter, Type 316 stainless steel, 7 strand-7 wires per strand, with minimum breaking strength of 19,125 lbs.
 - E. Equip data plate cable system entry points with prominently displayed non corrosive data plate clearly stating maximum service capacity, manufacturer's name, serial number, and manufacturing date.
 - F. Intermediate Support Brackets: Type 316 stainless steel, one piece. Brackets and fasteners shall be capable of supporting 1800 lbs, 5 position.
 - G. Entry/Exit Hardware: Type 316 stainless steel, with lanyard cable sleeve that moves continuously past the intermittent brackets; or permanent swaged end bracket with a detachable lanyard cable sleeve for entry exit purposes.
 - H. Tensioner Units: Type 316 stainless steel with polished finish.
 - I. Body Harness: Provide full body harness with shock absorber. Furnish two.

- J. End Anchors: Stainless steel, Type 304, designed to take 2 times the maximum load, based on the span, sag of the line, vertical free fall, type and length of lanyard and number of users.

PART 3-EXECUTION

3.01 EXAMINATION

- A. Examine job conditions before commencement of work. Do not begin work until conditions which will prevent installation of fall arrest system as specified, or which will may compromise performance of the system, have been corrected.

3.02 INSTALLATION

- A. Install life line anchors, including anchorage and mounting devices, according to approved shop drawings, the Specifications, the manufacturer's instructions.
- B. Supervise the setting of anchorage devices installed by others. Provide advice and assistance with respect to construction of other work related to products specified in this section.
- C. Install work true, level, tightly fitted, and flush to adjacent surfaces where required for installation.
- D. Deform threads of safety anchor studs behind nuts after nuts have been tightened.
- E. Attach roof anchors to steel that is large enough to accept a 4 inch diameter tube complete with 100% weld. The structure or plate provided to accept this anchor and must be at least 5 inches wide.
- F. Flashing of roof anchors is specified in Section 07540, and shall be performed by roofing installer.

3.03 ADJUSTMENT AND FINAL INSPECTION

- A. Verify that work done under this section has been completed correctly and that installed products function properly. Adjust items where necessary to ensure satisfactory operation.
- B. Complete the inspection log book to certify system for use.

3.04 INSTRUCTION OF OWNER'S PERSONNEL

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel in the use and maintenance of the fall arrest system. Refer to Section 01770, "Closeout Procedures and Submittals."

END OF SECTION 11014