

SECTION 11014 – WINDOW WASHING EQUIPMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Comply with the conditions of the Contract and Division 1 - General Requirements

1.2 SECTION INCLUDES

- A. Work of this section includes the design, supply and installation of window cleaning/suspended maintenance equipment anchors.

1.3 RELATED SECTIONS

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| A. Structural Steel Framing | Section 05120 |
| B. Metal Decking | Section 05310 |
| C. EPDM Membrane Roofing | Section 07531 |
| D. Sheet Metal Flashing and Trim | Section 07620 |
| E. Joint Sealants | Section 07920 |
| F. Hot & Cold water supply, faucets and drain at every roof level | Division 15 |
| G. Three phase 208 volts, 60 Hertz service at every roof level | Division 16 |
| H. Weatherproof power supply outlets with strain relief anchors | Division 16 |

1.4 REFERENCES

- A. AISC S342L-1993, with Supplement No.1 “Load and Resistance Factor Design Specification for Structural Steel Buildings”.
- B. AISI SG-971-1996, with 2000 Supplement “Specification for Design of Cold-Formed Steel Structural Members”.
- C. Aluminum Association AA ADM-1-Aluminum Design Manual, 2000” and AWS D1.2-1997 Structural Welding Code - Aluminum.
- D. AWS D1.1-2000 Structural Welding Code - Steel.
- E. ANSI/IWCA I-14.1-2001 Window Cleaning Safety Standard (General Industry Safety Standard, International Window Cleaning Association).

- F. ASME A120.1-2001, Safety Requirements for Powered Platforms for Building Maintenance.

1.5 DESIGN REQUIREMENTS

- A. Design window cleaning/suspended maintenance system to suit building and in accordance with plans, specifications, standards, and regulations/codes contained in sections 1.04 and 1.08.
- B. Locate anchorages to suit suspension equipment that will be used on the building with respect to items such as reach, rigging, spacing, roof edge condition, and similar items.
- C. Design all anchor components to provide adequate attachment to the building and suited to current window cleaning/suspended maintenance practices. Ensure compatibility with industry standard equipment.
- D. Ensure all anchor components conform to proper engineering principles and have been designed by a Professional Engineer qualified in the design of window cleaning/suspended maintenance equipment, its application and safety requirements.
- E. Design system fall arrest safety anchors and equipment supports to comply with the following structural requirements:
 - 1. Fall Arrest Safety Anchors: designed to a maximum fall arresting force of typically 1800 lbs. (8.0 kN) when wearing a body harness with a safety factor of 2 without any permanent deformation and to 5000 lbs. (22.24 kN) against fracture or detachment.

1.6 SHOP DRAWINGS and ENGINEERING CERTIFICATION

- A. Submit shop drawings showing complete layout and configuration of complete window cleaning/suspended maintenance system, including all components and accessories. Clearly indicate design and fabrication details, window “drops”, hardware, and installation details.
- B. Shop drawings to include installation and rigging instructions and all necessary Restrictive and Non-Restrictive Working Usage Notes and General Safety Notes.
- C. Shop drawings to be reviewed by a professional engineer, and upon request, complete with test reports.

1.7 QUALIFICATIONS

- A. Manufacturer: Work of this Section to be executed by manufacturer specializing in the design, fabrication and installation of window cleaning/suspended maintenance systems having a minimum of 5 years documented experience.
- B. Loading and safety assurance: Work of this Section to meet the requirements of governing codes and jurisdiction and to comply with properly engineered loading and safety criteria for the intended use.

- C. Insurance: Manufacturer to carry specific liability insurance (products and completed operations) in the amount of \$2,000,000.00 to protect against product/system failure.
- D. Welding to be executed by certified welders in accordance with AWS requirements.

1.8 REGULATORY REQUIREMENTS

- A. Comply with the following OSHA regulations:
 - 1. 1910, Subpart D (Walking and Working Surfaces).
 - 2. Appendix C to 1910 Subpart F (Personal Fall Arrest Systems).
 - 3. "OSHA Ruling on Window Cleaning by Bosun's Chair" Memorandum to Regional Administrators from P. K. Clark, Director, Directorate of Compliance Programs.
 - 4. 1910.66, Subpart F (Powered Platforms).
 - 5. IWCA/ANSI I-14.1 2001

1.9 MAINTENANCE DATA

- A. Submit 1 copy of system Equipment Manual & Inspection Log Book, with "Initial Inspection - Certification for Use" and "Inspection Sign-Off" forms completed.
- B. Submit 2 copies of a reduced plastic laminated as-built shop drawing showing equipment locations and details. This drawing is to be posted near exits onto the roof.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. This specification is based on systems currently being manufactured by PRO-BEL ENTERPRISES LTD. Toll free: 1-800-461-0575. Telephone: 905-427-0616, Fax: 905-427-2545, info@pro-bel.ca.
- B. Other manufactured products meeting this specification may be substituted provided that manufacturers show proof of product insurance. Equipment details to be approved by the architect and/or consultant. Companies, such as miscellaneous metal fabricators, who are not normally engaged in the design and manufacture of window cleaning/suspended maintenance equipment, are not permitted to bid.
 - 1. Basis of Design Product: PB Series Roof Anchors Model No. PBE 75-0000 as manufactured by Pro-Bel Enterprises Ltd or approved equal.

2.2 SAFETY & TIE-BACK ANCHORS

- A. Safety U-bars: Type 304 stainless steel with yield strength of 35 Ksi (240 Mpa). U-bar to be not less than 3/4" (19 mm) diameter material with 1-1/2" (38 mm) eye opening.

- B. Securement bolts: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000.
- C. Hollow steel section (HSS) piers: mild steel, Type 300W with yield strength of 50 Ksi (350 MPa). Wall thickness to suit application, hot dipped galvanized to ASTM A123/A 123M-2000.
- D. Base plate and all other sections: galvanized mild steel as above with yield strength of 44 Ksi (300 MPa). Thickness and securement to suit application.
- E. Miscellaneous bolts, nuts and washers: mild steel, Type 300W with yield strength of 44 Ksi (300 MPa), hot-dip galvanized to ASTM A123/A 123M-2000 or Type 304 stainless steel with yield strength of 35 Ksi (240 MPa).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and areas upon which the work of this section depends. Report to the Contractor in writing, 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.
- B. Verifysite dimensions.
- C. Commencement of work will imply acceptance of prepared work.

3.2 INSTALLATION

- A. Install equipment in accordance with approved shop drawings and manufacturer's recommendations.
- B. Co-ordinate installation with work of related trades.
- C. Install all work true, level, tightly fitted and flush with adjacent surfaces as required.
- D. Deform threads of tail end of anchor studs after nuts have been tightened to prevent accidental removal or vandalism.
- E. Manufacturer to assist and/or supervise installation of window cleaning/suspended maintenance equipment installed by others.
- F. Structural steel to receive safety anchors to have adequate bearing surface as indicated on shop drawings and/or to ensure 100% weld.

3.3 FINAL ADJUSTING AND INSPECTION

- A. Adjust and leave equipment in proper working order.
- B. Complete “Initial Inspection – Certification for Use” form included in Equipment Manual & Inspection Log Book.

END OF SECTION 11014