



Master Format 13 32 00 (05160) STEEL SPACE FRAMES, 13 330 Geodesic Structures, 05 10 00 Structural Metal Framing

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The provisions of all material, labour and supervision for the structural design, detail engineering, factory fabrication, installation and final inspection of the tubular shell frame in accordance with the project drawings and specifications.

1.02 RELATED WORK

- A. Cast in Place Concrete
- B. Structural Steel
- C. Metal Deck
- D. Skylights
- E. Glazing

1.03 SUBMITTALS

- A. All submittals will be in accordance with Section 01300, including shop drawings, structural calculations and product data.
- B. Shop drawings and structural calculations will bear the signature and stamp of a registered professional engineer.
- C. Shop drawings shall be submitted for review prior to fabrication which clearly indicate anchoring details, working points, connections, material sizes, specifications and finishes.
- D. Submit samples of finish as required for architect's selection and approval prior to factory application.
- E. Upon request, provide test reports on structural connections, tube materials and high strength threaded hardware.

1.04 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

- 1. The space frame will be manufactured by a firm having a minimum of ten years of experience in the design, fabrication and construction of space frame structures of similar nature and complexity.
- 2. The manufacturer will certify that all materials have been tested and approved as satisfactory in accordance with their intended use and these contract documents.

B. Installer's Qualifications:

- 1. The space frame installer will be trained by the manufacturer and all installation work will be under the direct supervision of the manufacturer's duly qualified site representative.

C. Design Criteria:

- 1. The space frame structure will be designed in accordance with the provisions of the specified building code(s) having jurisdiction over the project site. All shop drawings will bear the stamp of a professional engineer registered in the jurisdiction of the site if so required by the governing building code.
- 2. The structure will be capable of withstanding all forces as required by the _____ Building Code _____ (date) and as indicated on the contract drawings.

a. Dead Loads: Structure Weight plus superimposed dead loads as applicable:

- 1) Skylight/Glazing System _____psf
- 2) Metal Deck/Roofing System _____psf
- 3) Mechanical/Electrical Attachments _____psf
- 4) Special Fixtures _____psf
- 5) Other _____psf

- b. Live Load: _____psf
- c. Snow Load: Ground snow load _____psf
(plus all drift loads as required by the Building Code
or as indicated on the contract drawings)
- d. Wind Load: Basic wind speed _____mph
- e. Temperature Range: _____
- f. Seismic Zone: _____

1.05 DELIVERY, STORAGE & HANDLING

- A. All components will be wrapped and packaged in factory crating designed to protect the space frame finish during storage and handling procedures.
- B. Materials will be delivered to the site in a timely manner to insure uninterrupted progress of the work.

1.06 WARRANTY

- A. The manufacturer will issue a written guarantee to the owner that all work associated with the fabrication and installation of the space frame structure shall be free of defects in materials and workmanship for a period of one year from the date of inspection and acceptance of the work. Further, that any defects that may arise during this period will be repaired or replaced at no cost to the owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The frame structure as specified herein is based on the round steel tube and Triodetic hub connector system as manufactured by:

Triodetic Space Frames, Inc.
4465 East Genesee Street, PMB 306
Syracuse, NY 13214-2253
Tel: (800) 565-2743
Fax: (315) 453-7817

Triodetic Building Products Ltd
2753 Fenton Road
Ottawa, Ontario, K1T 3T8
Tel: (613) 822 2922
Fax: (613) 822 1375

- B. Substitutions may be considered under the provisions of Section 01600. The substitute product must be proven to be equivalent to the specified system by submitting drawings, details, samples and structural design data and calculations for architects review and evaluation prior to bid.

2.02 MATERIALS

- A. Round tubes formed to suit the Triodetic connectors: Steel ASTM A500 Grade B or C.
- B. Triodetic connectors and connector plugs: Aluminum alloy AA 6351-T6.
- C. Miscellaneous structural tube sections (purlins): Steel ASTM A500 Grade B.
- D. Connector washers and all miscellaneous structural sections, brackets weldments and connection plates: Steel ASTM A36.
- E. Threaded hardware: Steel ASTM A307, A325, A490 or A193-B7as required by design.
- F. Stainless Steel: Contact the manufacturer.

2.03 FABRICATION

- A. Structural elements will be factory prefabricated round tubular sections with cold-formed tooth ends to suit the mechanical connector. Tubular members will be accurately controlled in the forming operation to maintain precise length and angles in accordance with the required geometry.
- B. Mechanical connector nodes will be cylindrical aluminum extrusions, factory milled to the required length to accommodate the full length of the formed tubular members.
- C. All miscellaneous ancillary components as required by the contract documents will be accurately custom fabricated to insure compatibility with other related elements of the work.
- D. Stainless Steel: Contact the manufacturer.

2.04 FINISH

- A. Galvanizing

1. All steel structural tube components will be factory pregalvanized with chromate conversion and clear protective sealer coating (or hot-dipped galvanized on both interior and exterior surfaces).
2. All miscellaneous steel components will be hot-dipped galvanized (or electrogalvanized).
3. All threaded hardware will be hot-dipped galvanized (or electrogalvanized).

B. Factory Painting:

1. All space frame components including tube members, connectors, connector washers, purlins and miscellaneous structural sections and all miscellaneous connection plates, brackets and weldments are to be factory cleaned and pretreated with a phosphatized coating, and factory painted.
2. Factory paint system and materials will be (select option);
 - a. Polyester or polyurethane powdercoat paint finish.
 - b. Polyester, polyurethane or acrylic base baked enamel paint finish.
 - c. Acrythane paint finish with high-build epoxy base coat and acrylic urethane finish coat with a total dry film thickness of 3.0mils.
 - d. PPG Duracon thermoset acrylic paint finish by a licensed PPG applicator.
 - e. PPG Duranar fluoropolymer (Kynar 500) paint coating by a licensed PPG applicator.
3. All components will be oven-baked in accordance with the material specifications to fix the coating and provide a uniform surface appearance.
4. All threaded hardware will be electroplated (zinc alloy) and field painted with air-dry touch-up material to match the factory finish.
5. Architect will select color from manufacturer's full range of standard available materials. Color match samples will be submitted for architect's approval prior to factory painting.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Before proceeding with the installation work, all support and existing field conditions will be carefully examined to verify the suitability of the related elements to accept the work of this section. Any conditions found to be unsatisfactory will be reported to the contractor, and erection will not begin until satisfactory corrections have been made.

3.02 ERECTION

- A. The installation work will be undertaken by an authorized erector who has been fully trained by the manufacturer.
- B. Assemble and erect the frame structure in accordance with the manufacturer's instructions and in accordance with the shop and assembly drawings.
- C. Apply a clear lubricant at the interface between the formed tube ends of the structural tube components and the connector node in accordance with the manufacturer's recommendations.
- D. Use only special rawhide-faced mallets as provided by the manufacturer for assembly of the tube components. Metal hammers are not permitted.
- E. Install all component assemblies true to line and plumb. Inspect all attachment components for interface with other sections of the work to insure compliance with the required alignment and dimensions as noted in the shop drawings.
- F. Repair any scratches or damages to the finished surface. On painted applications, touch up all exposed threaded hardware with air-dry material to match the factory finish.
- G. Perform a thorough final inspection of the completed frame installation by authorized manufacturer's personnel, and certify in writing that all work has been satisfactorily completed in accordance with the contract documents.

3.03 FIELD QUALITY CONTROL

- A. All assembly and installation work will be conducted under the direct supervision of the manufacturer's qualified site representative.

3.04 CLEANING

- A. Upon completion of the installation work, remove all protective wrapping from assembled components, clean up all packaging materials, unused spare components and litter and leave work area in a clean and satisfactory condition. Dispose of all waste materials in containers provided as directed by the contractor.
- B. Contractor shall provide all protective measures necessary to prevent dirt and damage from the work of other trades on or around the finished space frame structure.