

ALUMINUM TRUSS SUPPORTED FLAT COVER SPECIFICATION

1. SCOPE OF WORK

- A. The truss roof fabricator/erector shall furnish all labor, materials and equipment required to design, fabricate, deliver and erect aluminum truss supported flat covers with all appurtenances as shown on the contract drawings and as specified herein.

2. DESIGN

- A. The truss roof shall conform to the specified dimensions and shall consist of flat aluminum covers supported by a series of braced aluminum trusses. Full provisions shall be made to allow for thermal expansion of the truss/flat cover roof system. The dead weight of the roof shall not exceed 3.5 pounds per square foot of covered area.
- B. Each truss shall be a clear span structure consisting of aluminum structural members arranged uniformly in a pattern of triangular spaces. The trusses shall be designed to be self-supporting from the tank wall, and shall be braced to resist all specified design loads.
- C. The flat covers shall consist of formed interlocking aluminum panels supported at the ends by the bottom chord of the trusses or the top of the tank wall. The dead weight of the flat covers shall not exceed 150 pounds per panel, and each panel shall be easily removable with a lifting force equal to the dead weight of the panel.
- D. The truss roof shall be designed as a relatively airtight system under all design load conditions. Continuous aluminum flashing with Hypalon gaskets shall be used to close the ends of the formed panels and to hold the panels securely in place.
- E. Aluminum stiffener angles shall be factory welded to the underside of the formed panels. The top surface of the panels shall be flush and free of tripping hazards such as bolt heads or fasteners of any type.
- F. The truss roof shall be designed to accommodate all ductwork, access hatches, existing equipment and all other pertinent items as required.
- G. Dissimilar materials which are not compatible shall be physically separated or insulated from each other by means of gaskets or insulating compounds.
- H. Fasteners shall be designed with a safety factor of 2.34 on ultimate strength and 1.65 on yield strength.

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- I. All welded components shall be designed in accordance with the Aluminum Structural Welding Code, ANSI/AWS D1.2-90.

3. MATERIALS

- A. Structural framing (trusses, beams, cross bracing), bearing plates and ledger angles: 6061-T6 extruded aluminum, mill finish.
- B. Flat cover panels and closure flashing: 5052-H36 or 6061-T6 formed aluminum sheet, 0.090" thick, mill finish.
- C. Panel stiffener angles: 6061-T6 aluminum, 2" X 2" X 3/16", mill finish.
- D. Fasteners: 7075-T73 anodized aluminum or series 300 stainless steel.
- E. Sealant: Silicone by Pecora, General Electric, or equal.
- F. Gaskets and closures: Hypalon, Silicone rubber, or equal.
- G. Expansion anchor bolts: series 300 stainless steel.
- H. Vents and hatches: 6061-T6, 5052-H36, 5086-H34 or 3003-H16 aluminum, 0.090" nominal thickness. Hatches shall have 4" X 3" X 1/4" curbs with locking hasp.

4. DESIGN LOADING

- A. The truss roof shall be designed in accordance with the "Specifications for Aluminum Structures" as published by the Aluminum Association and designed for full dead load plus live loads in accordance with applicable local codes.
 1. Basic Live Load [psf]:
 2. Ground Snow Load [psf]:
 3. Wind Load:
 4. Seismic Zone:
- B. The flat covers shall be capable of supporting a concentrated load of 250 pounds applied to any one square foot area, not acting simultaneously with the above live loads.

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- C. The maximum deflection of the flat covers under total dead and live load conditions shall not exceed $L/120$, where L equals the span of the flat cover panel.
- D. Trusses shall be designed to resist all loads imposed during erection without exceeding allowable stresses or causing permanent deformation.

5. SHOP DRAWINGS AND DESIGN CALCULATIONS

- A. Before executing any of the work in this section, the truss roof manufacturer shall submit prints or drawings to the Owner and/or Engineer showing dimensions, sizes, thicknesses, gauges, materials, finishes, joint attachments and erection procedure, including erection bracing, guying and sequence of work.
- B. A complete set of design calculations for the truss roof shall also be submitted for approval. These calculations shall be signed by a registered Professional Engineer. The truss roof shall be fabricated and erected in accordance with the approved drawings.
- C. Certification(s) from the manufacturer of the aluminum used in the fabrication of the truss roof shall be submitted stating that the alloys have been tested, inspected, and are in compliance with the requirements of this specification.
- D. An affidavit certifying that the specified material alloys, sizes and quantities have been furnished shall also be submitted by the truss roof fabricator/erector upon completion of the work.

6. FABRICATION AND ERECTION

- A. Complete design and construction of the truss roof and all appurtenances as specified herein shall be performed by one single manufacturer and installer.
- B. The truss roof manufacturer shall field verify all existing dimensions and elevations prior to commencing fabrication of the truss supported flat covers.
- C. The truss roof fabricator/erector shall comply with all Aluminum Association and AISC specifications and standards applicable to the work specified herein. All work shall be performed with mechanics skilled and experienced in the fabrication and erection of aluminum structures.
- D. All field work shall be directed by a qualified supervisor who will remain on the jobsite until completion of the work.

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- E. Field refabrication of structural components and flat cover panels will not be accepted, and forcing of the structure to achieve fit-up during construction shall be expressly forbidden.
- F. All bolted connections shall use series 300 stainless steel lockbolts or hex head bolts, hex head nuts and circular flat plate washers under the head and nut of all bolts.
- G. Field welding of aluminum shall not be allowed.

7. QUALIFICATIONS TO BID

- A. The truss roof fabricator/erector must have installed and had in satisfactory service for a period of not less than five years at least one aluminum truss supported flat roof with a span equal to or larger than the unit specified, and shall submit evidence of such with his bid proposal and/or pre-bid submittal.
- B. The experience requirement may be waived if the truss roof manufacturer provides a five-year Maintenance Bond to guarantee the structural safety and satisfactory performance of the roof under the design conditions specified herein. Proof of the ability to furnish the required bond shall be submitted to the Engineer not less than seven (7) days prior to the receipt of bids. The bond shall provide that the manufacturer will remedy problems causing unsatisfactory service within thirty (30) days after written notice of the problem. If the roof is not restored to conform to the requirements specified herein, the manufacturer shall replace the roof with one that meets these specifications or he shall forfeit the bond. The bonding period shall commence upon written acceptance by the Engineer or Owner of the roof and all appurtenances thereto.
- C. The truss roof fabricator/erector must not have designed, manufactured or installed any structure(s) for which a total of partial collapse has occurred after completion of the roof construction. The occurrence of any structural failure(s) must be noted in the bid proposal and/or pre-bid submittal.
- D. The aluminum truss roof shall be manufactured by TEMCOR of Gardena, California, (800-421-2263) or an approved equal.

8. WARRANTY

- A. The truss roof shall be guaranteed for a period of one (1) year against defective design, materials and construction.
- B. Provide Maintenance Bond as specified in (Item 7.B) if qualifications to bid are not met.

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