SPECIFICATION FOR ENGINEERED RECESSED MOUNTED ALUMINUM COVERS

I. General

1. This specification is for a fully engineered, substantially airtight, recessed mounted aluminum cover structure comprised of panels, and beams as manufactured by Hallsten Corporation, P.O. Box 41036, Sacramento, California 95841, (800) 473-7440. This specification shall be regarded as a minimum standard for design and fabrication. Other cover system types such as formed aluminum, dome, fiberglass, carbon steel, or geomembrane shall not be acceptable and will not be considered for this project.

2. Scope of Work:
Furnish all labor, materials, and equipment to provide a complete, installed system of fixed and removable, custom fit, flat aluminum covers. The Tank Cover system includes cover panels, structural supports, and attaching hardware.

Please list all tanks, channels, etc. where an engineered cover system is required and clearly identify on the contract drawings provided:

1. 
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II. Engineering

A submittal shall be provided to the engineer prior to the beginning of fabrication. The submittal shall include:
(a) Complete structural calculations showing the governing stresses in all members and connections, and detailed shop drawings. Preliminary drawings shall be stamped by cover manufacturer's PE. Final Drawings and calculations shall bear the stamp of local state PE if required.
(b) Manufacturer's standard guarantee.
(c) A letter of certification signed and sealed by a registered Professional Civil Engineer confirming that the aluminum cover is in full compliance with the plans and specifications including any testing provisions included therein.

III. QUALIFICATIONS

1. Manufacturer:
Shall be a company specialized in providing engineered aluminum covers for wastewater treatment tanks/troughs for at least ten (10) years. When requested by the Engineer, submit written evidence to show experience qualifications and adequacy of plant capability and facilities for performance of contract requirements.
2. Erector:
Regularly engaged for at least ten (10) years in the erection of aluminum covers for wastewater treatment tanks.

3. Welders:
Qualified within the past two (2) years in accordance with AWS.

IV. Performance

1. Span:
The clear span length of the cover shall be as noted in the scope of work.

2. Width:
The inside width of the cover shall be as noted in the scope of work.

3. Walking surface elevation:
Installed cover system walking surface elevation to be equal with or recessed below top elevation of tank/basin walls. This system requires the installation of a structural ledger angle mounted to the inside face of the tank/basin or some type of imbedded shelf.

4. Distributed Design Live Load and Deflection:
All structural components shall be designed to support the dead weight of the structure, plus a live load of 50 pounds per square foot of surface. The maximum deflection of any component under this load shall not exceed L/240 of the span of that component. In no event shall the dead load deflection exceed the rise of any component in order to avoid surface ponding.

5. Concentrated Live Load:
The structural components shall be designed to support a 400-pound load on a 6” X 6” area located anywhere on the surface of the structure without permanently deforming the tested area.

6. Design Stresses:
All allowable design stresses in structural aluminum shall be in accordance with the "Specifications for Aluminum Structures" for building-type structures by the Aluminum Association.

7. Skid Resistance:
The cover shall possess an integral non-skid surface and no exposed area of cover system wider than one inch shall be without ribs/non-skid surface. The aluminum-decking surface of the structure shall be Hallsten’s Deck Slat, which is ribbed to provide an aggressively non-skid surface. The edges of adjacent deck slats shall double interlock so that the slats shall act together. The decking surface shall be manufactured form 6061-T6 alloy. The Manufacturer of the non-skid surface shall demonstrate in writing satisfactory performance for a minimum period of 10 years in the wastewater industry for the intended purpose. This surface shall not be achieved by the use of paint, adhesive tapes, sand blasting or any other meanse other than an extruded process.
8. Chemical Resistance:
Panels shall be fabricated entirely of 6061-T6 corrosion resistant aluminum extrusions. Every panel to beam connection shall be chemical resistant and will not weaken or corrode and will interlock. A mechanical and replaceable Santoprene seal shall isolate the cover perimeter from the concrete wall. No foam tape or caulk shall be allowed.

9. Configuration:
The aluminum cover shall be composed of panels and beams. All panels shall interlock with the adjoining beam/beams without the use of threaded fasteners. Uplift of each panel will be resisted with the use of an integral latch system. The weight of an individual panel shall not exceed 150 pounds. Each removable panel shall be easy to remove without disruption of adjacent panels and the lifting force required shall not exceed the dead weight of the panel.

V. Materials

1. Aluminum:
All aluminum used in the fabrication of the cover shall be alloy 6061-T6. All plate shall be alloy 6061-T6. Material shall be new and of top quality.

2. Welding Electrodes:
Welding shall be with electrodes of an alloy, which shall produce welds with strength and corrosion resistant characteristics compatible to the base metal.

3. Fasteners:
All fasteners between aluminum components shall be stainless steel or structural plastic. Aluminum shall be isolated from dissimilar materials by means of a stainless steel spacer or an elastomeric isolator. Beams and panels shall be fastened to concrete using stainless steel drill in place anchor bolts.

4. Steel Accessories:
No carbon steel components shall be used.

5. Seals:
A mechanical and replaceable Santoprene seal shall isolate the cover perimeter from dissimilar materials such as concrete and steel. No foam tape or caulk shall be allowed for isolation of cover system.

6. Access Hatch Panels:
Access to any location under the cover shall be gained through integral gear hinged access hatches. The Access Hatch Panels shall have the identical properties as the rest of the aluminum cover including loads, deflection and slip resistance specifications. The access-hinged panels shall be the full panel width. The length of the access panel shall be clearly indicated on drawings. Hinged panel components including hinges, decking and lifting handles shall be extruded 6061-T6. While in the closed position the hatches will be completely flush therefore posing no tripping hazard. In the open position the panel shall lie flat on the cover and will not need a hold open device.
7. Handles:
Handles shall be an integral flush mounted aluminum and incorporated into the non-skid deck slat.

**VII. Fabrication and Workmanship**

1. Workmanship:
The quality of workmanship shall be equal to the best general practice in modern structural fabrication shops. Workmanship, fabrication, and shop connections shall be in accordance with the latest edition of ANSI/AWS D1.2 "Structural Welding Code - Aluminum".

2. Experience:
The manufacturer must furnish adequate evidence of a minimum of ten (10) years of ongoing experience in the manufacture of similar structures.

3. Preparation for Welding:
All components to be welded shall be free of dirt, grease, and other contaminants and shall fit up properly for sound welding. Surfaces to be welded may not be cut with oxygen. Sawing, shearing, or machining may be used.

4. Welding Procedures:
All welding shall be with an inert gas shield arc process. Machine settings shall be developed with test welds of the same material, alloy and geometry as the work pieces and samples will be tested destructively.

**VIII. Testing**

1. Loads:
After installation the cover structure will be tested for conformance with the deflection limits. A load of 400 pounds will be placed as directed by the Engineer and the maximum deflection created by the load will be measured.

2. Prequalified Shop Testing:
MANUFACTURER shall perform a prequalified shop air tightness test and certification for the cover components proposed. This test shall be performed in accordance with the “Procedural Standards for Testing, Adjusting and Balancing of Environment System” as published by the National Environmental Balancing Bureau (NEBB) on cover components of not less than 80 square feet. Said test shall be conducted and witnessed by a NEBB certified technician. The method of testing, test apparatus and proposed contents of the test report shall be submitted to the ENGINEER for approval. Subsequent to the receipt of ENGINEER’S approval, the MANUFACTURER shall set up testing protocol and schedule the test. The MANUFACTURER will provide the ENGINEER with at least 72 hours notice prior to the scheduled test. A report of the test shall be prepared by the certified technician and shall be sealed with the NEBB seal. The report shall include a description and illustration of the test components, a description and illustration of the test apparatus and a report of the results. The cover shall maintain an air intrusion leakage rate not to exceed 0.2 cfm per square foot at an applied negative pressure of 0.2 inches of water column for a 5-minute duration.
IX. Delivery and installation

1. Delivery:
Delivery of the components of the structure shall be made to a location nearest the site that is accessible to over the road trucks, unless otherwise specified.

2. Storage:
The manufacturer shall be responsible for jobsite storage of the delivered components. The components shall be stored off the ground on level surface in such a manner as to prevent damage.

3. Installation:
The manufacturer shall furnish such personnel, tools, equipment, and materials as required to install the cover using the recommended procedure.

4. Contractor Installation:
The cover manufacturer can provide installation instructions, on site supervision, and inspection if desired.

5. OEM Manual:
The manufacturer shall provide an OEM Manual that includes drawings, maintenance instructions, and removal and replacement instructions for the installed cover.