

VI. FABRICATION & WORKMANSHIP

defects which will affect uniform appearance of finished surfaces. The gangway structure shall be given an AA-M44 (coarse matte) sandblasted finish after fabrication. The handrails shall have a rubbed or light brushed finish.

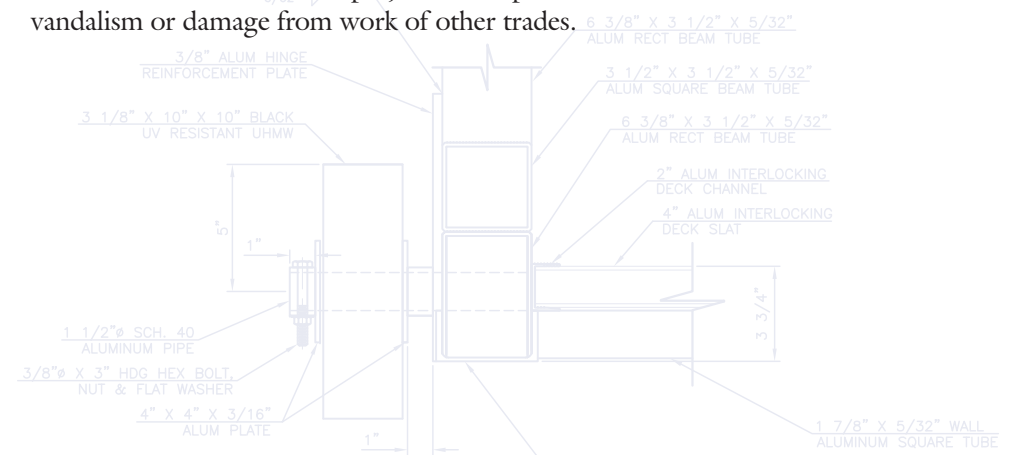
- WELDING:** All aluminum welding, welding procedures, testing and inspection shall be done in accordance with AWS D1.2. Parts to be welded shall be free of dirt, grease and other contaminants and shall fit up properly for sound welding. Surfaces may not be cut with oxygen. Sawing, sheering or machining may be used. All welding shall be with an inert gas shielded arc process. Machine settings shall be developed by making test welds of the same material alloy and geometry as real members and testing the sample welds destructively.
- COORDINATION:** The purchaser will be responsible for unloading the gangway from the truck and placing it into position. The gangway fabricator will notify the purchaser in advance of the expected time of arrival.

VIII. DELIVERY & STORAGE

- DELIVERY:** Delivery of the gangway will be made to the location nearest the site which is accessible to over-the-road trucks, unless otherwise specified.
- STORAGE:** Store units at project site to prevent vandalism or damage from work of other trades.



Lite-Span™ Aluminum Gangway



ALUMINUM STRUCTURES BY
HALLSTEN
 CORPORATION
 INDUSTRIAL • MARINE • ENVIRONMENTAL
 SACRAMENTO, CA (800) 473-7440

MAILING ADDRESS:
 P.O. Box 41036
 Sacramento, CA 95841
 Tel: (916) 331-7211
 Fax: (916) 331-7223

PLANT ADDRESS:
 6944 34th Street
 North Highlands, CA 95660



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Hallsten Corporation A Technical Overview

Hallsten Corporation has developed a full line of structural aluminum products. These products are based on a structural system that has evolved through our experience in the design and fabrication of metal structures since 1966. These various products are used in marine, industrial and environmental applications. The basis for the structural system is a unique set of interlocking aluminum components. The use of these components provides a structural system that is very versatile, can be used in a variety of structures and provides unmatched strength and durability.



In the early 1970's Hallsten Corporation pioneered the use of aluminum components for the construction of structures to be used in a marine environment. The extreme corrosion resistance of aluminum in combination with the inherent strength of aluminum extrusions provided the basis for a marine structural system that provided unmatched quality and value. These early structures were fully assembled with welded connections. Hallsten Corporation continued to refine the design of these structures and by the 1980's had eliminated the majority of the welds required to assemble the components. The welded connections were replaced with details that included specialized adhesives as well as nonthreaded mechanical connectors. Where welds were retained, the welds were designed to minimize the effect of fatigue induced in the heat effected areas. These welds were located in areas with minimal cyclical loading. Additionally, the remaining welded connections were designed with longer individual welds,

which tend to be more fatigue resistant. The weldless design proved to be highly fatigue resistant as well as much more structurally efficient than a fully welded design due to the elimination of these heat effected areas and their corresponding allowable stress reductions.

The weldless structural design resulted in the issuance of United States Patent number 5,050,361, "Deck Structure". This structural system is comprised of panels that include the primary structural beam section as a frame member for the decking system. When assembled, the structure becomes self-framing as well as self-supporting.

Hallsten Corporation has established a reputation for our unique ability to create products that employ modular structural systems. These products allow Hallsten Corporation to engineer specific structures utilizing a family of predesigned components. The result is high performance, efficient structures at very competitive prices. Hallsten Corporation continues to provide design-build structures to a variety of industries. In addition to aluminum and steel structures for

marine applications, Hallsten Corporation provides aluminum covers for wastewater and water treatment plants, and aluminum and steel structures for industrial applications. Typical of these are industrial mezzanines, stairways and ramp systems, conveyor crossovers and bridging structures as well as steel truss bridges for pedestrian and light vehicle use.



V. MATERIALS

- 1. ALUMINUM:** Aluminum shall be marine grade series 6061-T6 or 6063-T6.
- 2. DECKING SURFACE:** Decking surface shall be knurled and sandblasted to provide an aggressive non-skid surface and shall be installed perpendicular to the slope of the gangway. Deck slats shall be Hallsten's double interlocking deck slat, so that adjacent slats will act together.
- 3. HANDRAIL:** Top of guard rail shall be 42" above decking. Top rail shall be 1 1/2" schedule 40 aluminum pipe. The handrail shall be fabricated with multiple intermediate rails such that a 4" sphere cannot pass through the rail at any point (UBC requirement). Intermediate rails shall be 1 1/4" diameter by 1/8" wall aluminum tubes. The handrail shall be fabricated with straight horizontal rails with ends finished with plastic end closure caps. The handrail shall be fabricated with an interior project handrail located 34" above the
- 4. WHEELS:** Wheels shall be 6" diameter by 2" wide and be installed at the lower end of the gangway. The wheels shall be Delrin with a 1" stainless axle. A grease fitting shall be provided for lubrication. The axle shall pass through doubler plates welded to the box beam frame.
- 5. UTILITIES:** Utilities (electrical, water, gas and sewer) shall be attached to the underside of the gangway by means of an aluminum utility hanger track framing system.
- 6. TRANSITION RAMP:** A hinged transition ramp shall be provided at the lower end of the gangway to make a smooth transition between the gangway deck and the landing. This transition ramp designed to slide on the landing should be the full width of the deck and extend out

deck with end loops at both ends of the gangway extending 12" past the end of the beams (ADA requirements). Handrail shall be 1-1/2" diameter by 1/4" wall aluminum tube.

from the gangway end 4 feet minimum.

- 7. WHEEL TRACKS:** Wheel tracks for the gangway wheels shall be aluminum angles.
- 8. RUB PLATES:** Rub plates for the gangway transition plate shall be aluminum flat bar.
- 9. SHORE HINGE PLATE:** Shore hinge plate shall conform to ASTM A-36 and shall be hot-dip galvanized with a minimum of 2 ounces of zinc per square foot of surface after fabrication. Shore hinge plate shall be 6" wide by 12" longer than gangway width and of 3/8" material. The hinge plate shall have two (2) 6" long 1 1/2" schedule 40 pipe segments welded on to match gangway hinge.

VI. FABRICATION & WORKMANSHIP

- 1. WORKMANSHIP:** The quality of workmanship shall be equal to the best general practice in modern structural fabrication shops. Fabrication shall occur in the shop when possible.
- 2. EXPERIENCE:** The fabricator must be able to furnish adequate evidence of a minimum of ten (10) years of ongoing successful experience in fabricating bridge-type aluminum structures, and that all workmen employed in aluminum fabrication are properly experienced and skilled in the work they are called upon to perform.
- 3. FINISH:** Before finishes are applied, exposed aluminum sheets, plates, and extrusions shall be free of roll marks, scratches, rolled-in scratches, kinks, stains, pits, orange peel, die marks, structural streaks, and any other



II. ENGINEERING

1. **SUBMITTALS:** The submittal shall include:

A. SHOP DRAWINGS:

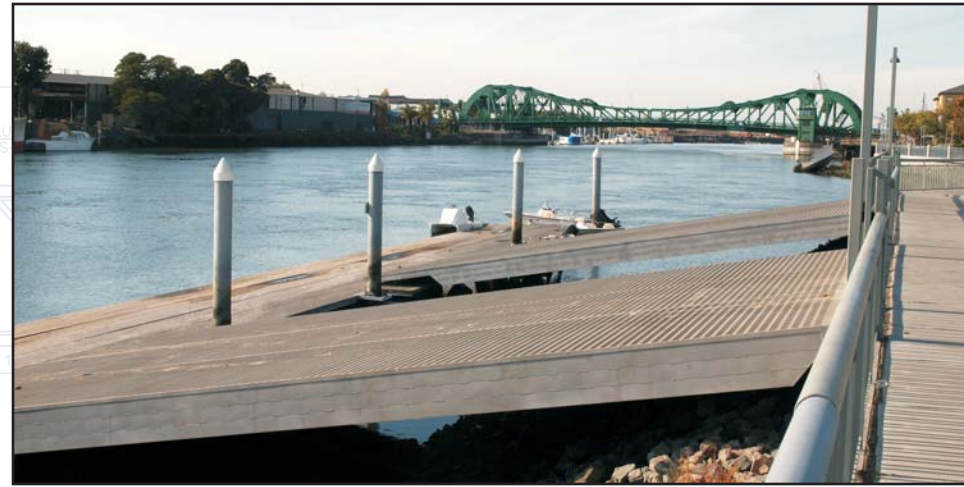
Indicate pertinent dimensioning, materials, clearances, general construction, materials, finishes and connections.

Shop drawings stamped by a State of California Licensed Civil Engineer.

B. STRUCTURAL CALCULATIONS:

Calculations stamped by a Licensed Professional Engineer, if required.

C. CERTIFICATIONS: Cut sheets or certificates of compliance, as appropriate.



adequacy for performance of contract requirements.

2. **WELDERS:** Qualified within the past two (2) years in accordance with AWS.

3. 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.

4. CONCENTRATED LIVE LOAD:

All 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.

5. FLOTATION LIVE LOAD:

For the purposes of calculating the freeboard of a dock supporting the gangway, the live load can be assumed to be 20 pounds per square foot.

6. DESIGN STRESSES:

All allowable design stresses in structural aluminum shall be in accordance with the "Specifications of Aluminum Structures" for bridge-type structures by the Aluminum Association.

IV. PERFORMANCE

1. **SPAN:** The clear span length of the gangway shall be as noted in the scope of work.

2. **WIDTH:** The inside width of the gangway shall be as noted in the scope of work.

III. QUALIFICATIONS

1. **MANUFACTURER:** Shall be a company specialized in providing pre-fabricated customized aluminum gangways for at least ten (10) years. When requested by the Engineer, submit written evidence to show experience qualifications and



SPECIFICATIONS FOR LITE-SPAN™ ALUMINUM GANGWAY

I. GENERAL

1. SPECIFICATION:

These specifications are for a fully CAD designed and engineered clear span aluminum gangway and are the minimum standards for design and fabrication. Gangways shall be designed and manufactured by Hallsten Corporation, P.O. Box 41036, Sacramento, CA 95841. Phone: (800) 473-7440, Fax: (916) 331-7223.

2. PRODUCTS:

Finish work shall be firm, well anchored, in true alignment, properly squared, with smooth clean uniform appearance, without holes, cracks, discoloration, distortion, stains, or marks. Products shall be fabricated so that connections between products, materials and alignment, are consistent with the drawings.



3. SCOPE OF WORK: Furnish all labor and materials to provide a complete pre-fabricated customized aluminum gangway. Hallsten's custom gangways also include a transition ramp, wheels, rub plates, and a shore hinge plate.

4. REFERENCES:

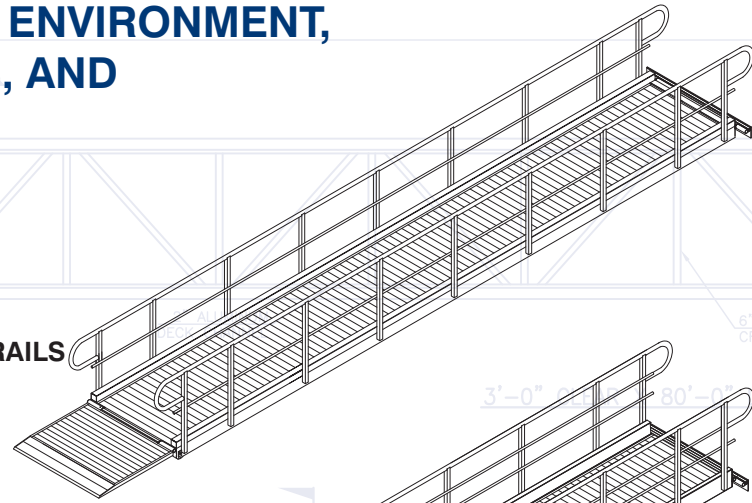
- A. ASTM – American Society of Testing Materials
 - i. B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet Plate.
 - ii. B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles & Tubes.
- B. AWS – American Welding Society
 - i. D1.2 – Structural Welding Code – Aluminum
- C. Aluminum Design Manual, Aluminum Association
 - i. "Specifications for Aluminum Structures" for bridge-type structures
- D. United States Access Board
 - i. "Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines," July 23, 2004, "ADA Accessibility Guidelines for Recreation Facilities".



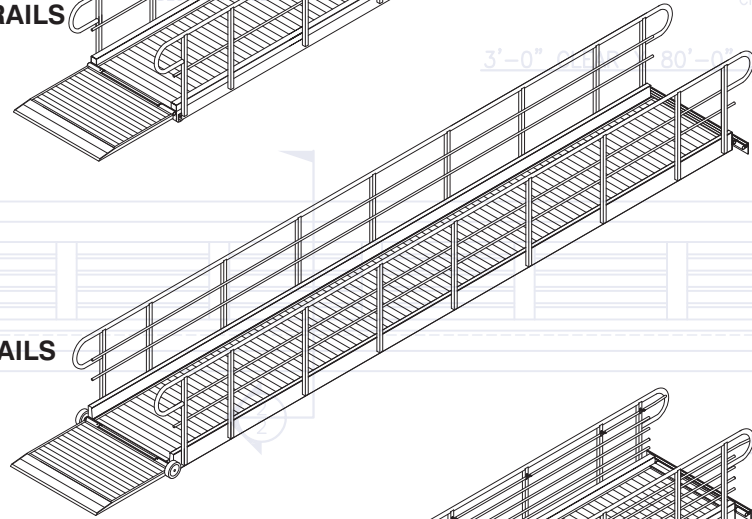
THROUGHOUT THE WORLD, HALLSTEN LITE-SPAN™ ALUMINUM GANGWAYS PERFORM IN EVERY ENVIRONMENT, MEET TIME AND COST BUDGETS, AND ENHANCE THE MARINA DESIGN

SAMPLE ISOMETRIC DRAWINGS

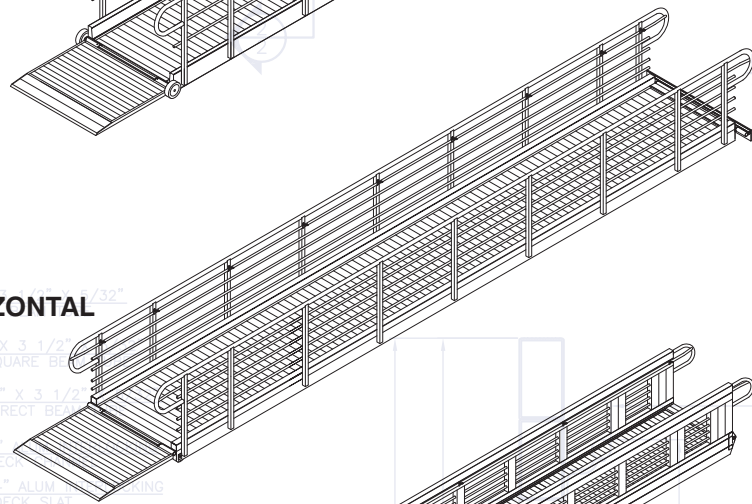
STANDARD 4' X 30' GANGWAY WITH 2 HORIZONTAL RAILS



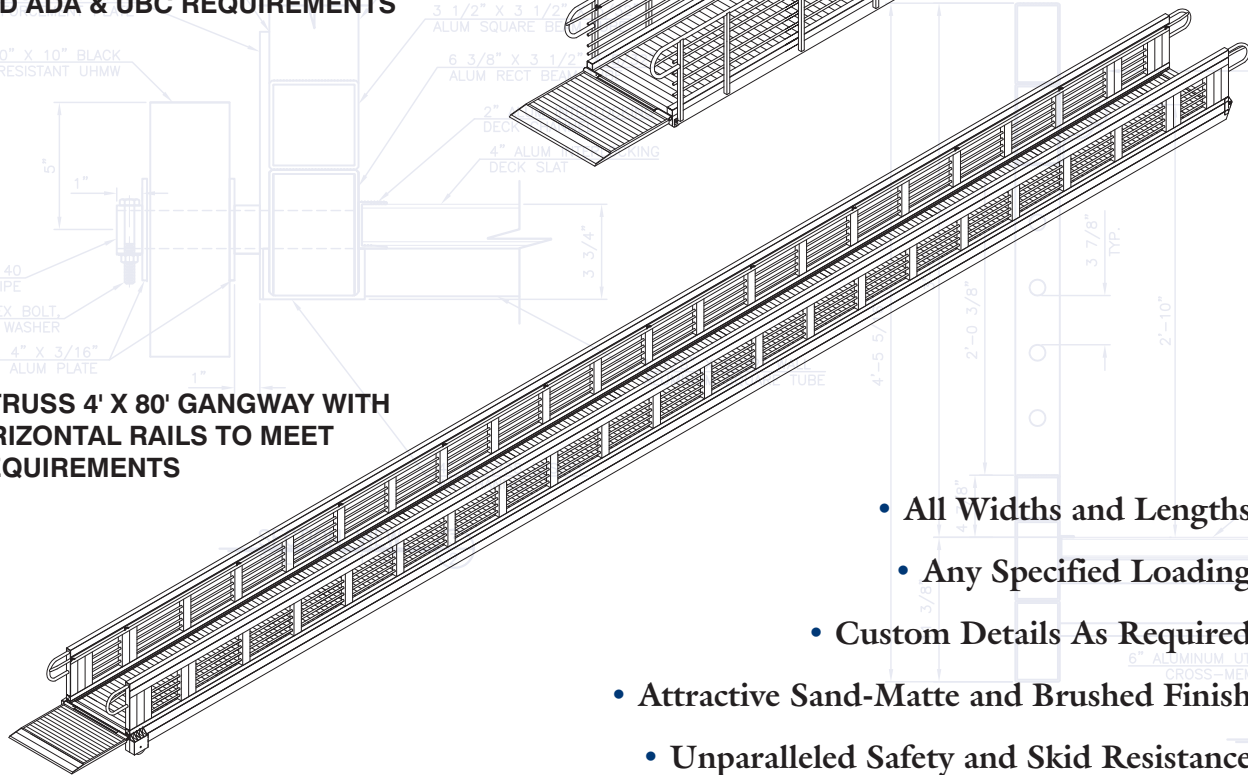
LITE-SPAN 4' X 30' GANGWAY WITH 3 HORIZONTAL RAILS



STANDARD 4' X 30' GANGWAY WITH MULTIPLE HORIZONTAL RAILS TO MEED ADA & UBC REQUIREMENTS



VIERENDEEL TRUSS 4' X 80' GANGWAY WITH MULTIPLE HORIZONTAL RAILS TO MEET ADA & UBC REQUIREMENTS



- All Widths and Lengths
- Any Specified Loading
- Custom Details As Required
- Attractive Sand-Matte and Brushed Finish
- Unparalleled Safety and Skid Resistance

LITE-SPAN™ MARINE GANGWAYS

The attractive “no maintenance” solution for Gangways - in fresh or salt water. Free yourself from all maintenance problems, save on costs, with marine alloy aluminum gangways which retain their attractive appearance.

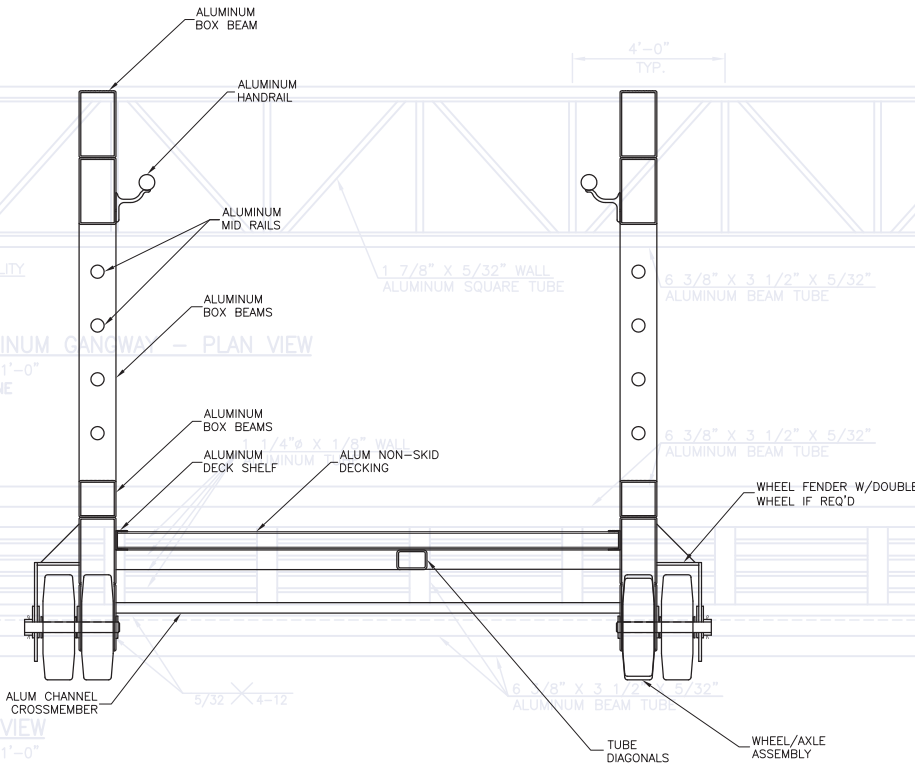
- **MAINTENANCE FREE**
The marine alloy aluminum used in Lite-Span™ Gangways resists corrosion. Will not rot, split, or rust. Needs no painting or other protective coatings.
- **VERSATILE**
Lite-Span™ Gangways structures can be engineered to meet your existing conditions. Complete boarding systems for complex boarding configurations can be accommodated.

• **COMFORTABLE and SAFE**
Lite-Span™ Gangways decking provides safety underfoot for shod or bare feet. A unique deck surface treatment provides unparalleled slip resistance - dry or wet. No ecological hazards are created by aluminum in any water. Lite-Span™ gangways structures can be designed to meet any load and spanning requirements.

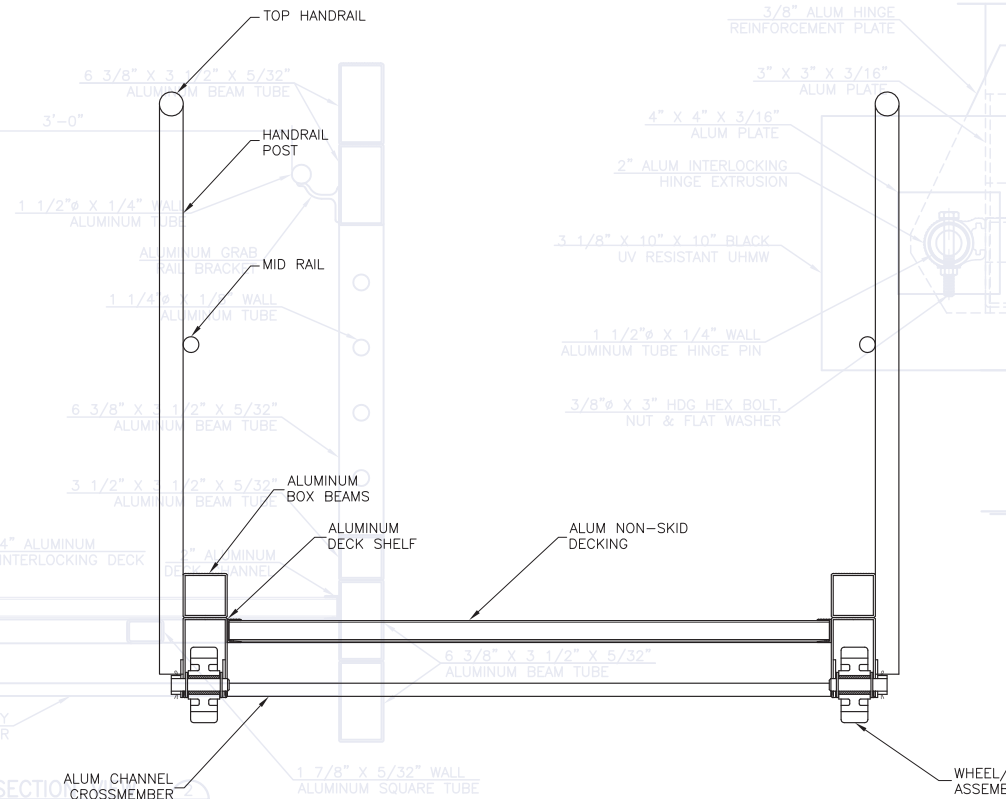
• **DURABLE**
Lite-Span™ Gangways are fabricated of high strength, marine aluminum alloy. All assembly is by Gas Metal Arc Welding using the latest techniques in welding technology. Wherever possible, automatic welding processes are employed to assure high quality construction. The welding assembly and the inherent properties of aluminum provide a gangway structure which is maintenance free and which will retain a new appearance through years of service.

• **EASY TO USE**
Aluminum’s light weight, combined with its strength and the rugged construction of Lite-Span™ gangways, makes them easier to handle than gangways of any other material. They may be transported with light vehicles. In most cases, they can be put into place or removed without cranes or special equipment.

• **THE BOTTOM LINE**
Lite-Span™ Gangways by Hallsten Corporation make you money. With sound, efficient engineering and design, high quality fabrication, and no maintenance requirements, Lite-Span™ gangway systems assure a high return on your marine equipment investment.



VIERENDEEL TRUSS GANGWAY CROSS SECTION



STANDARD GANGWAY CROSS SECTION