

SECTION 13125 – Permanent Grandstands

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE OF WORK

Provide labor, materials, equipment, engineering, and installation to provide a new permanent grandstand structure in accordance with the following specifications:

A. Minimum acceptable criteria:

1. Design per plan view and sectional view drawings.
2. All structural steel must be manufactured by an AISC certified structural steel manufacturer.
3. All steel to be hot-dipped galvanized after fabrication.
4. Concrete foundations shall be designed by the grandstand manufacturers engineer based on architect/owner provided geotechnical report.
5. The overall length of grandstand shall be as per architectural drawings.
6. The number of rows shall be as per architectural drawings.
7. Height of front cross aisle from grade shall be as per architectural drawings.
8. Width of front walkway to be as per architectural drawings
9. The rise per row shall be as per architectural drawings.
10. The depth per row shall be as per architectural drawings.
11. Net seating capacity shall be as per architectural drawings.
12. ADA seating shall be as shown on architectural drawings.
13. The riser shall be structurally connected to the decking system panel every 12” longitudinal with ¼” diameter structural grade rivet.
14. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments.
15. Aluminum extrusions using alloy 6063-T6 and 6061-T6.
16. Understructure framing consist of galvanized structural steel columns, supports and stringers that form a clear span design per drawings.
17. All welded connections shall be by certified steel and aluminum welders
18. Aisle and Egress stairs shall have a ½” overlap.
19. At locations where platforms meet end to end a beveled four inch wide aluminum threshold shall be provided to cover the walking surface.

20. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system.
21. All seat support, aisle step supports, aisle handrails and risers shall be installed from the topside of the decking system. There shall be no through bolting of these items through the riser system.
22. Guardrail system shall consist of all-aluminum guardrail posts and railings with galvanized/vinyl coated chain link fencing.
23. Grandstand manufacture must have a written quality control program for manufacturing, shipping and installation.
24. Walking surface shall be fluted and slip resistant.

B. Related Sections include the following:

1. Division 3 Section "Cast-in-place Concrete" for concrete mix design and testing requirements.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide a complete system of mutually dependent components and assemblies that form a grandstand system. The grandstand shall be designed to conform to structural and other load requirements, thermally induced movement, and exposure to weather without failure. All primary and secondary framing, decking system, seating, handrails /guardrails, ramps and accessories shall comply with the requirements indicated, including those in this Article.
- B. Structural Performance: Provide grandstand system capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Design Loads / Structural – Framing Members
 - a. Dead Loading: 6 PSF for understructure
 - b. Live Loads: 100 PSF for understructure
 - c. Deflection Limits: engineer assemblies to withstand design loads with deflections no greater than the following:
 1. Stringers: vertical deflection of $L/240$
 2. Design Loads / Decking System
 - a. Dead Loading: 6 PSF for decking, platforms, stairs and ramps
 - b. Live Loads: 100 PSF for decking, platforms, stairs and ramps
 - c. Deflection Limits: engineer assemblies to withstand design loads with deflections no greater than the following:

1. Decking, platforms, stairs and ramps: vertical deflection of $L/360$
- d. Sway loads of 24 PLF per row parallel to seat and 10 PLF per row perpendicular to seat run.
3. Design Loads / Handrail / Guardrail
 - a. 100 PLF Vertical
 - b. 50 PLF applied in any direction at the top
 - c. 200 LB Concentrated load any direction
 - d. 50 PSF Fencing and guardrail infill
4. Design Loads / Seat Boards
 - a. Live loads: (vertical) 120 pounds per lineal foot

1.4 SUBMITTALS

A. Shop Drawings:

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following grandstand system components as follows:

1. Foundations:
 - a. Footings, foundations, reinforcement and anchor bolt setting plan.
2. Structural framing: All structural framing members shall have a permanent piece mark that shall correspond to the shop drawings and bill of material.
3. Primary and secondary framing including but not limited to the following:
 - a. Columns
 - b. Beams
 - c. Stringers
 - d. Bracing
 - e. Connecting hardware
4. Welded Decking System:
 - a. Decking Platforms
 - b. Risers
 - c. Supports for Seats
 - d. Aisle Steps
 - e. Aisle Handrails
 - f. Egress Stairs
 - g. Hardware
5. Seating
6. Handrails / Guardrails
7. Ramps

1.5 QUALITY ASSURANCE

- A. Concrete Installers Qualifications: An experienced installer who has completed concrete work similar in material, design and extent indicated for this project and whose work has resulted in construction of grandstands with a record of successful in-service performance. Concrete installer must be certified by grandstand manufacturer.
- B. Erector Qualifications: An experienced erector who has specialized in erecting and installing grandstands similar in material, design, to the extent indicated for this project and whose work has resulted in construction of grandstands with a record of successful in-service performance. Grandstand Erector must be certified by grandstand manufacturer.
- C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of grandstand systems that are similar to those indicated for this Project in material, design and extent. All approval drawings shall bear the seal of a registered professional engineer in the state of installation.
- D. Quality Control: Manufacturer's written quality control for manufacturing, shipping and installation shall be submitted prior to award of contract.
- E. Standards and Guidelines: Comply with the provisions of the following codes, specifications and standards, latest editions, except as otherwise noted or specified:
 - a. American Concrete Institute (ACI)
 - b. American Institute of Steel Construction (AISC)
 - c. American Welding Society (AWS)
 - d. Americans with Disabilities Act (ADA)
 - e. Underwriters Laboratory (UL)
 - f. National Electrical Code (NEC)
 - g. International Building Code (IBC)
 - h. International Code Council 300 (ICC 300-2012)
- F. Site visitation: Bidder shall be responsible for visiting the job site prior to the bid date to verify site conditions.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Grandstand materials and other manufactured items will be packaged and loaded for transport to prevent bending, warping, twisting, and surface damage of materials. Care will be taken at the job site to prevent any damage to materials.

B. Grandstand materials must not be stored where they would come in contact with other materials that might cause staining, denting or other surface damage.

1.7 WARRANTY

A. All products after proper erection, and under normal use for this type of structure shall carry a one (1) year warranty against all defects in materials and workmanship.

PART 2 PRODUCT

2.1 MANUFACTURERS

Structural Steel Framing Members and Aluminum Decking System
Outdoor Aluminum, Inc. Geneva, AL (Basis of design) 1-800-225-4249

2.2 CONCRETE FOUNDATIONS

- A. Foundations shall be designed in accordance with mix designs per Section 03310- Concrete Work.
- B. Foundations shall be based on a subsurface exploration report furnished by the Architect/Owner.

2.3 STRUCTURAL – FRAMING MEMEBERS

- A. Structural-Steel Shapes: ASTM A992/A992M tensile yield strength, 345 MPa (Fy = 50 ksi); tensile ultimate strength, 450 MPa (Fu = 65 ksi)
- B. Steel Plate, Bar or Strip: ASTM A 36/A 36M
- C. Steel Tubing or Pipe: ASTM A 500, Grade B
- D. Bolts, Nuts and Washers: ASTM A 307 A (ASTM A307) hex carbon and alloy steel bolts, nuts, and washers.
- E. Anchor Rods, Bolts, Nuts and Washers: As follows:
 - 1. Headed Bolts: ASTM A 307, Grade A carbon –steel hex-head bolts and nuts.

- F. Finish: Minimum 2 oz. hot dipped galvanized in accordance with ASTM 123-A with minimum thickness of 3.3 mils.
- G. Horizontal Beams: Horizontal beams shall be wide flange units, supported on columns as required to transfer stadium loads to foundations.
- H. Vertical Columns: Columns shall be of structural square tube.
- I. Bracing: All transverse bays shall be free of cross bracing. Longitudinal bays shall be braced in alternate bays where possible. All bracing shall be 7/8" rod and shall be double-nutted at connection points through the columns.
- J. Stringers: Stringers shall be wide flange material with welded angle riser and tread supports.

2.4 DECKING SYSTEM:

A. Decking System Platforms

1. Decking system platforms shall be an all-aluminum extruded system attached to the understructure by means of concealed aluminum clips, galvanized bolts, washers and nuts. The rear portion of the platform will turn ninety degrees vertical to accept the next row of decking platforms. The front portion of the platform shall be complete with a female front edge to allow for a positive male / female connection of a vertical riser. Individual aluminum components shall be joined by means of the metal inert gas process. The attachment of the riser to the platforms shall form a structurally integrated system.
2. Individual platforms shall be tread depth x 37'-6" maximum length with the actual length designed to create the minimum number of expansion seams.
3. Platform shall have a minimum aluminum wall thickness of .078" and aluminum shall be alloy 6063-T6.
4. Walking surface shall be fluted non-skid.
5. The platforms shall have integral bolt runners to allow for the attachment of seat supports, aisle steps and aisle handrails to be made without penetrating the decking system. Through bolting is prohibited. After installation of the above components, there shall be a full closure of the bolt runner using an aluminum cover strip. Open portions of the bolt runner are prohibited.
6. Deck shall allow for reconfiguration of seating and aisles without alteration of the understructure.
7. At locations where platforms meet end to end a four-inch wide aluminum threshold shall be provided to cover the walking surface.

Threshold shall be beveled on both sides so as not to create a trip hazard and must have a fluted surface to prevent slipping. Threshold shall be integrated with front and rear covers for the platforms that conceal transition from the horizontal to the vertical portions of the deck. Threshold must comply with specified deflection criteria and once installed must allow for expansion and contraction.

B. Decking System Riser

1. The decking system riser shall be extruded aluminum; alloy 6063-T6 with a 204 R1 anodized clear finish.
2. This extrusion shall have a male ridge running continuous at the upper leading edge to interlock with the front portion of the decking system panel.
3. The riser shall be structurally connected to the decking system panel every 12" longitudinal with ¼" diameter structural grade rivet.
4. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments.

C. Decking System Seat Supports

1. The decking system seat support shall be of extruded aluminum angle.
2. Once installed the seat support shall have no noticeable gaps between the decking system riser and support.
3. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system.

D. Decking System Aisle Handrails

1. The decking system aisle handrails shall be 1-5/8" schedule 40 anodized aluminum pipe.
2. Handrails shall have a center line handrail and the spacing between rails shall not be less than 22" or more than 36". Handrails shall be discontinuous and shall not span more than five rows of seating.

E. Decking System Egress Stairs

1. The decking system egress stair stringers shall be constructed of 8" aluminum channel, alloy 6061-T6. Tread supports shall be welded to 8" member to totally cap the end of the 2" x 12" stair tread against the channel web.
2. Walking surface of tread shall be complete with female front edge to allow for positive male / female connection of the riser closure. All risers to be fastened to the rear tail of the stair tread with ¼" diameter structural grade rivet.

3. Stair tread nosing to be anodized black. Nosing shall have no external fasteners.
4. Stair grab rail to be constructed of 1-5/8" schedule 40 anodized aluminum pipe with no fittings at transition from sloped system to grade.

F. Decking System Hardware

1. All bolts, washers and nuts shall be galvanized.
2. End caps shall be of a heavy duty, clamping, aluminum channel design fastened to the ends of extrusions with aluminum rivets. End caps shall close all end openings of extrusions and shall be a full-length piece and match in both color and finish the extrusion to which they attach.
3. All riser fasteners shall be structural 1/4" diameter structural grade rivet.

2.5 SEATING AND OPTIONS

A. Bench Seating

1. Seats shall be of extruded aluminum with a fluted non-skid surface, alloy 6063-T6, with 204R1 anodized clear finish
2. Plank shall be 2" by 10" nominal with a wall thickness of .078" (+ / - .006" industry tolerance) at the smooth surface.
3. Finish size shall be 1-3/4" by 9-1/2"
4. Seats shall attach to the decking system seat supports by means of concealed aluminum clips, galvanized bolts, washers and nuts.
5. Seat supports shall be installed on centers that will meet or exceed deflection criteria required by code.
6. End caps shall be of extruded aluminum and shall match in both color and finish the plank to which they attach. All end caps shall be single piece and shall attach to the underside of the plank with a minimum of two aluminum rivets.

B. Optional Backrests (minimum 28" tread depth required)

1. Backrests shall be of extruded aluminum with a fluted surface, alloy 6063-T6, with 204R1 anodized clear finish. (Optional: powder coated finish as specified by owner).
2. Plank shall be a minimum 2" by 6" contour nominal with a wall thickness of .078" (+ / - .006" industry tolerance).
3. Backrests shall attach to an anodized aluminum channel stanchion and the stanchion shall connect to the underside of the seat plank. The stanchion shall connect to the backrests and seat plank using concealed aluminum clips.

4. End caps shall be of cast aluminum attach to the plank with two stainless steel pan head screws.
- C. Optional Self -Rising Chairs (minimum 30” tread depth required)
1. Chairs shall be designed to allow the seat pan to flip up allowing for the specified clear aisle access way. Aisle access way shall be measured with the chair unoccupied.
 2. Seat portion of chair shall be gravity activated with an internal quieting bumper.
 3. All welded one piece steel stanchions and arm rest supports.
 4. Finish for all supports shall be black powder coated.
 5. Stanchions shall be an integral part of the grandstand system.
 6. Seat back and pan shall be the only installation required in the field.
 7. Seat pan and back shall be blow molded plastic with color throughout. Color shall be selected by the owner prior to installation.
 8. There shall be no gap in warranty and completed liability insurance between the chair portion of the project and the grandstand portion. Grandstand manufacturer shall provide a written one year warranty for the grandstand self-rising chairs.
- D. Optional Seat and Row Lettering
1. Seat numbering shall be clearly and permanently marked with computerized engraving system.
 2. Seats shall be marked at 18” minimum on center.
 3. Row numbering shall be clearly and permanently marked with material providing a high contrast, high-resolution mark.
 4. Row lettering shall be marked on the end caps.

2.6 HANDRAILS / GUARDRAILS

1. All railing shall consist of 1-5/8” schedule 40 anodized pipe.
2. All pipe fittings shall be of cast aluminum.
3. Guardrail supports to be 4” aluminum channel, alloy 6061-T6.
4. Rail pipe shall be secured to the guardrail support by means of galvanized tension bands.
5. The top rail shall be 42” minimum above the nearest seat on the sides and rear, and 42” above the tread on the front walkway.
6. Handrails on stairs shall be 34” above the leading most edge of the stair tread.
7. A galvanized or black vinyl coated chain link fence shall be provided on the front, sides and rear of the grandstand and at all egress areas.

8. Handrails shall be provided at all walking areas and shall extend 1-1/2" from guardrail material. Standoff shall be extruded aluminum, alloy 6061-T6
9. Handrails shall have internal sleeves for splice purposes and finished rail shall be continuous and shall not exceed 1-5/8" diameter.

2.7 RAMPS

- A. Wheel chair accessible ramps with a minimum 60" clear width and a maximum 1:12 slope shall be provided, conforming to code.
- B. Understructure shall be constructed of same materials as grandstand support structure.
- C. Decking and handrails shall be constructed of same materials as grandstand decking.

PART 3 – EXECUTION

3.1 EXAMINATION

Before erection proceeds, certified grandstand installer will survey elevations and locations of concrete foundations or pads and anchor bolts to verify compliance with the requirements of grandstand manufacturers' tolerances.

3.2 ERECTION

- A. Erect grandstand system according to manufacturer's written instructions and erection drawings.
- B. Do not field cut, drill or alter structural members without written approval from grandstand system manufacturer's professional engineer.
- C. Set structural framing in locations to elevations indicated according to AISC specifications referenced in the specification.

3.3 CLEANING AND PROTECTION

- A. Clean all metal surfaces promptly after installation of work.
- B. Exercise care to avoid damage to protective coatings and finishes.
- C. Remove all excess construction material and dispose of all debris.

END OF SECTION 13125