SECTION 13 34 16

ALL ALUMINUM FRAME BLEACHER

PART 1 - GENERAL

1.1 GENERAL

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

1.2 SCOPE

A. These Specifications cover the requirements for the design, fabrication, delivery and installation of the permanent all aluminum grandstand system, including the following:

1. Concrete foundations
2. Non-Elevated Grandstand
3. **[40" Elevated Grandstand with Front Walkway]**
4. Aluminum treads and risers
5. Aluminum Aisle steps
6. Guardrails and handrails
7. Seating
8. Ramps, stairs, and landings
9. Grandstand finishes
10. [Vertical closure]

1.3 RELATED SECTIONS AND DOCUMENTS

A. Concrete – Division 3

B. Pressbox – Division 13

1.4 CODES AND STANDARDS

A. Perform all work in accordance with the latest editions and revisions of the following standards, which hereby become part of this section.

1. ICC 300 – Standard for Bleachers, Folding and Telescopic Seating and Grandstands
2. International Building Code, Edition 2018 **[2015, 2012]**
3. Local Building Code Amendments **[LIST STATE]**
4. AWS D1.2 – Structural Welding Code – Aluminum
5. Aluminum Design Manual (ADM), 2015
6. ACI 318 - Building Code Requirements for Structural Concrete
7. The Society for Protective Coatings (SSPC)

1.5 GRANDSTAND CONTRACTOR QUALIFICATIONS

A. Manufacturer/Fabricator Qualifications:

1. Experience: Manufacturer/fabricator with not less than 10 years experience with successful production of products and systems to the specified scope of Work, with a record of successful in-service performance and completion of similar projects for a period of not less than 10 years, and with sufficient production capability, facilities, and personnel to produce required Work.

2. Approved manufacturer:

a) Dant Clayton Corporation – Louisville, KY

B. Installer Qualifications:

1. Experience: Installer with not less than 5 years experience in performing specified scope of Work, with a record of successful in-service performance and completion of projects for a period of not less than 2 years, and with sufficient production capability, facilities, and personnel to produce required Work.
2. Manufacturer/Fabricator Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer/fabricator to install products.

C. Delegated Engineering Responsibility: Contractor shall employ a qualified professional engineer licensed in the state where the project is located to provide engineering for products and systems as required.

1.6 PERFORMANCE REQUIREMENTS

A. Design Loads: Engineer to withstand design loads including but not limited to gravity, wind, seismic, and erection design loads and shrinkage/thermal movements as established by authorities having jurisdiction, applicable local building codes, and as indicated.

1.	Superimposed Dead Load	6 psf
2.	Live Load	100 psf
3.	Sway Load	24 plf per row parallel to row
4.	Sway Load	10 plf per row perpendicular to row
5.	Wind Load	Design per local building code
6.	Seismic Load	Design per local building code
7.	Guardrail Loads	Design per local code

B. Grandstand System Self Weight: Self-weight of the grandstand system shall be incorporated into the project calculations for both foundations and framing.

C. Structural Deflections: Limit live load deflections of aluminum footboards, aluminum seatboards and structural steel framing and any other flexural members to L/200 of the span.

D. Structural Drift: Limit the horizontal frame drift of the grandstand system to H/200 of the frame height under sway, wind and seismic loads.

E. Dimensional Tolerances: Engineer and detail products, systems and connections back to primary structural elements to accommodate fabrication tolerances and dimensional tolerances of framing members and adjacent construction.

1.7 SUBMITTALS

A. Approval Drawings: Submit for review detailed approval drawings as follows:

1. Drawings shall include at a minimum:

a) All dead, live and other applicable loads used in the design.
b) Detailed and dimensioned foundation, framing, layout, and seating plans.
c) Foundation sizes, locations and elevations shall be shown in compliance with surrounding Work and relationships to finish grade.
d) Seating plan indicating all aisles, walkways, seating sections and exits.
e) Sections and details showing complete methods of assembly and anchorage:

i. Show riser heights and platform widths
ii. Show stair and ramp sections including railings
iii. Show overall sections showing railings systems, sightlines (when required by scope)

f) Connection details showing size, type, and grade of all plates, bearings, inserts and anchors.
g) Finishes.
h) Joint covers.

2. All approval drawings submitted shall be sealed by a professional engineer who is licensed in the state where the project is located.

3. Equipment Hung From Seating Units: No pipe, ducts or other equipment shall be hung from the seating units without written approval of the Delegated Design Engineer. Coordinate all attachment methods and fastener types with the Delegated Design Engineer to ensure they are suitable for the selected system.

B. Delegated Design Engineering Calculations: Calculations submittal for products indicated to demonstrate conformance with specified design loads, element stiffness and performance requirements including structural analysis data signed and sealed by the professional engineer responsible for their preparation licensed in the state where the project is located.

C. Qualification Data: For firms and persons specified in "Quality Assurance" to demonstrate their capabilities, experience and qualifications. Submit for record lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified

1. Manufacturer qualifications
2. Professional Engineer qualifications

D. Samples for Verification: For each type of exposed material, color, finish and texture.

E. Warranty: Sample of standard warranty.

1.8 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver grandstand components in such quantities and at such times to sufficient for construction activities to occur without delay.

B. Storage: Store components with adequate dunnage.

C. Handling: Handle and transport components in a position consistent with their shape and design to avoid excessive stresses which would cause damage.

1.9 QUALITY CONTROL BY CONTRACTOR

A. For grandstand members furnished under this Section, quality control inspection and testing shall occur during the manufacture of the components, and the components are subject to the approval of the engineered seating bowl supplier's Quality Control Manager.

B. Plant Quality Control: Provide copies of plant quality control program describing procedures for the following:

1. Overall quality control measures
2. Verifying sizes and critical dimensions of members.
3. Verifying position of plates, inserts, and other embedded items.
4. Final inspecting of products prior to shipment.

1.10 WARRANTY

A. Special Warranty: Manufacturer’s standard 1-year warranty is required in which manufacturer agrees to repair finish or replace components that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 PERMANENT ALL ALUMIMINUM GRANDSTAND SYSTEM COMPONENTS

A. Single Source Responsibility: Furnish each type of product from a single manufacturer/fabricator. Provide secondary materials only as recommended by manufacturer/fabricator of primary materials.

B. Basis of Design: The design for permanent all aluminum grandstand is based on a system designed and engineered by Dant Clayton.

C. Concrete Foundations and Slabs: Design of concrete foundations shall be based on an assumed 1,000 psf minimum bearing capacity and validated by the project geotechnical engineer

1. All design, detailing, fabrication and installation shall be in accordance with ACI 318.
2. Cast-in-place concrete shall have a minimum compressive strength of 4,500 psi with air entrainment of 6% +/- 1%.
3. All reinforcing steel shall be in accordance with ASTM A615 with a minimum yield strength of 60,000 psi.
4. Provide a minimum 6” thick layer of free draining compacted granular fill beneath the concrete slab.

D. Aluminum: Provide aluminum components at locations as shown on drawings, noted below and in compliance with the following:

1. All detailing, fabrication, and erection shall be in accordance with the code required edition of the Aluminum Design Manual.

E. Understructure

1. Understructure shall be fabricated from 6061-T6 alloy aluminum extrusions
2. Vertical members shall be 2 7/8” O.D. tubing
3. Horizontal braces and footrest supports shall be 3” x 2 7/8” channel.
4. Cross braces and diagonals shall be 2 ¼” x 7/8” channel
5. Handrail support shall be 2 5/8” O.D. tubing.
6. The understructure shall be assembled from the above items in an interlocking design using 7/16” x 3 ½” hot-dipped galvanized bolts
7. The structure shall be a bolted design so that in the even of accidental damage the sub-component parts may be replaced using common hand tools. Field welding for repair purposes shall not be considered
8. Aluminum angle understructure is an acceptable substitution provided 3” x 3” x ¼” aluminum angles are used for vertical and horizontal members. Smaller sizes are specifically prohibited. Understructure will be a bolted assembly. Welded connections are not allowed.

F. Decking System

1. Footboards

a) The deck planking shall be maintenance free, corrosion resistant all aluminum decking
b) Decking shall be 6063-T6 extruded aluminum with fluted surface. Extrusions shall have a minimum actual vertical support rib height of 1.75” and a nominal wall thickness of 0.080”
c) There will be no gaps between the longitudinal joints of the planking.
d) All aluminum extrusions shall be directly attached to the aluminum support structure without the use of hardware. Attachment shall be positive snap and interlock design. The use of bolt clips, bolt runners, or other friction type fastening devises are not acceptable.

G. Risers

1. The decking riser system shall be extruded aluminum; alloy 6063-T6 with a fluted surface and a wall thickness of 0.78”.

2. Fluted opening in the decking and risers system for attachment of seats, seat brackets and railing systems are not acceptable due to their tendency to collect debris and require excessive owner maintenance.

H. Seating

1. Aluminum Bench Seats:

a) Seats shall be 6063-T6 extruded aluminum with a fluted surface and a wall thickness of 0.078". Seatboards shall be a minimum of 9 1/2" wide actual, with outside legs of 1 3/4" actual vertical height and shall have two internal legs with a vertical height of 2 5/8".
b) Seatboards shall attach with one 3/8" diameter bolt and shall be designed for positive physical fastening. Bolt clips, bolt runners or other friction type fastening devices are not acceptable.

2. **[Aluminum Bench Seats with Backrest:**

a) **Seats shall be 6063-T6 extruded aluminum with a fluted surface and a wall thickness of 0.078". Seatboards shall be a minimum of 9 1/2" wide actual, with outside legs of 1 3/4" actual vertical height and shall have two internal legs with a vertical height of 2 5/8".**
b) **Shop bent aluminum backrest stanchion brackets shall be 6063-T6 extruded aluminum, welded to attachment angle. The bracket assembly attaches to each seat support using galvanized hardware.**
c) **Stanchions shall be heat treated and clear anodized (unless otherwise noted in Finishes).**
d) **Contoured 7" aluminum backrest shall be 6063-T6 extruded aluminum with fluted surface and extruded legs that allow it to rest on the tops of the stanchion brackets.**
e) **Ends of backrest will have cast aluminum endcaps.]**

3. Handicap Seating as shown on drawings. Deviations from handicap seating design are not allowed.

I. Aisle Steps

1. Aisle step units are to be provided at all intermediate aisle locations as shown on the architectural drawings and be made from 1.75" aluminum extrusions and plate material.
2. Aisle step units shall be mounted to the stadia system with pop rivets or galvanized hardware.
3. Aisle steps will be designed to satisfy row depth with vertical closure panels at the ends of the intermediate steps. No cavity or recessed closure is allowed in area of foot travel.
4. Provide a finish and texture matching that of the stadia tread and riser system to which they are installed. See Finishes.
5. Provide stair nosing at steps and treads.
6. Shall be designed to resist loads imposed from any step mounted rails.

J. Guardrail & Handrail System

1. Chain Link Fence Guardrail System:

   a) Guardrails shall be anodized aluminum extruded channel, 3” x 2 7/8”, 6061-T6 alloy, anodized to clear 204R1
   b) The guardrail system shall be of interlocking design with positive through-bolt fastening. The top rail shall be designed to fully cover the rail support posts for a totally snag-free area and eliminate the potential of sharp edge contact with spectators.
   c) Chain link Fence shall be 2” mesh, 6 gauge black vinyl coated fabric

2. Handrail System

   a) Aluminum handrails shall be provided in all areas required by building code and as indicated on the architectural drawings at all locations of new aluminum stadia treads and risers.
   b) Handrails shall be 1 15/16" O.D. extruded aluminum pipe. Straight pipe shall be 6061-T6 aluminum alloy with minimum yield strength of 35 ksi. Bent pipe shall be 6061-T4 aluminum alloy with minimum yield strength of 21 ksi.
   c) Aisle handrails shall be two-line and feature internal fittings for both lines of rail. External fittings are not permitted.
   d) Aisle handrails shall be mounted to the aisle steps with connecting bracket or floor flange.
   e) Handrails on all ramps and stairs shall provide 1-1/2” clearance from the guardrail material and shall extend 12” past the last riser with a return. Newel posts will not interrupt handrails. Handrails will not project more than 4.5” into the width of a stair or ramp.

K. Stairs

1. Shall conform to all above pertinent criteria consistent with the component design of the grandstand.
2. Shall be self-supporting and shall not attach to or be suspended from any footboard or decking member.
3. Stairs shall be fully closed deck tread and riser.
4. Handrail will be inset from guardrail 1 ½” to 3”.

L. Ramps

1. Frames shall be 9" x 1.40 extruded aluminum mill finish channel with 3" x 1.4" extruded aluminum mill finish vertical channel columns.
2. Treads shall be 6063-T6 extruded aluminum with a fluted surface and a minimum wall thickness of .078". Minimum vertical height of treads shall be 1.75" actual.
3. Handrail will be inset from guardrail 1½” to 3”. Guardrail will not be used for handrail.
4. Guardrailing to match grandstand design unless otherwise noted.
5. Decking aluminum extrusions will run perpendicular to the direction of traffic. Deck aluminum extrusions shall interlock for additional rigidity.

6. Anti-skid tape is not allowable to correct for deviations to paragraph 4 above.

M. End Caps

1. All end caps shall be one-piece cast aluminum and shall be friction fit to the plank without the use of mechanical fasteners.

N. Hardware

1. Bolts used for field installation shall be galvanized
2. Primary connections, i.e. seat, cross-brace, handrail (rail and posts) shall be made with minimum of 3/8" diameter hardware
3. Stainless steel expansion anchors

O. Vertical Closure System

1. Corrugated Aluminum Riser

a) Riser closure shall consist of an overlapping configuration of 8" x 0.100" wall thickness 6063-T6 aluminum extrusions, with a 1" forward facing corrugation.
b) Riser overlap shall be ½" min. and 2" max.
c) Riser closure to span between rail post spaced at 6'-0" c/c.
d) Aluminum top cap to be provided where gaps are created between top of closure and decking walking surface.
e) Closure to be attached to rail post with stainless steel mechanical screws.

2. **[Flat Stackable Riser**

a) **Riser closure shall consist of a stackable snap-in 1" x 6" 6063-T6 aluminum extrusion with 0.100" wall thickness. Stacked risers to provide a flat finish front**
b) **Riser closure to span between rail post spaced at 6'-0" c/c.**
c) **Aluminum top cap to be provided where gaps are created between top of closure and decking walking surface.**
d) **Closure to be attached to rail post with stainless steel mechanical screws.]**

3. **[Architectural Panel System (APS)**

a) **Faux masonry wall paneling consisting of 3/4" thick finished fiber cement boards.**
b) **Shiplap edging on all sides, providing a tight, seamless appearance.**
c) **Integrated hidden steel and aluminum support framing mounts panel system to the grandstand, ramp, or stair structure.**
d) **All attachment components and hardware to be hidden, providing a clean exposed faux masonry wall.**
e) **Aluminum trim wall cap provided at top of panel system.]**

P. Finishes

1. Aluminum:

a) Aluminum Finish Descriptions:

i. Mill Finish: natural appearance of the aluminum as it comes from the rolling mill with no further surface treatment.
ii. Anodized Finish: Anodized aluminum provided shall meet or exceed AAMA 611-14 specifications for Anodized Architectural Aluminum
iii. Powder Coat Finish: Powder coat system provided shall meet or exceed AAMA 2604 specification for Super Durable Polyester TGIC
iv. Slip Resistant Deck – SRD: Mill finish aluminum that has a sandblasted walking surface to meet the textured finish noted below
v. Stain and Slip Resistant Deck – SSRD: Powder coat and textured finish meeting the textured finish noted below, and the powder coat finish above

b) Footboards and Walkways

i. Mill
ii. SRD
iii. SSRD
iv. SRD/Anodized
v. Slip Resistance of Walking Surfaces:

(1) All stadia system walking surfaces will provide an equivalent or greater Static Coefficient of Friction (SCOF) of 0.6 in all directions of travel, using ANSI/NFSI B101.1-2009 testing method by the National Floor Safety Institute.

c) Risers

i. Anodized
ii. Powder Coated

d) Seat boards

i. Anodized

e) Seat backs

i. Anodized
ii. Powder Coated

f) Vertical Closure

i. Anodized
ii. Powder Coated

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas and conditions with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the work

B. Before installation proceeds, installer shall prepare written report, endorsed by installer, listing conditions detrimental to performance of the work. This includes survey of elevations and locations of concrete foundations or pads and anchor bolts to verify compliance with the requirements of the grandstand manufacturers' specified tolerances.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install grandstand and all components according to manufacturer's written instruction and the approved shop drawings.

B. Do no field cut, drill or alter structural members without written approval from grandstand system manufacturers' engineer.

3.3 CLEANING

A. Clean all surfaces according to manufacturer's recommendations.

B. Use cleaning solutions and methods that do not damage finishes or the adjacent surfaces.

C. Mill finish aluminum surfaces are unprotected from oxidation. All mill finished aluminum will oxidize at various rates during the manufacturing, shipping, installation and usage of the grandstand as it is exposed to various weather conditions. Oxidation is natural and expected, and in no way impacts the life cycle or structural performance of the grandstand. Grandstand manufacturer is not responsible for repair, replacement or cleaning of oxidized aluminum.

D. Remove all metal burrs, sharp edges or other cutting, unsafe, conditions.

E. Touch up finishes as recommended by manufacture.

END OF SECTION