SECTION 13 34 16.02
VISITOR SIDE ALUMINUM SEATING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SUMMARY

A. Provide engineering, material, freight, installation, and supervision to provide a new aluminum seating structure in accordance with the following specifications.

B. Related work specified elsewhere:

1. Section 03 30 00 – Concrete
2. Section 05 12 00 – Structural Steel

1.3 SYSTEM DESCRIPTION

A. The grandstand structure shall be steel with aluminum treads, risers and bench seats meeting the minimum following criteria and these specifications:

1. FBC Accessibility
2. Base the design upon a 1,000-seat capacity per the Educational Specifications.
3. Provide approximately 15 Rows by 135'-0" long, as shown on the drawings.
4. Steel column and beam structure, column spacing as shown on the documents.
5. Fully closed interlocking deck system with gutters or welded decking.
6. 60" minimum wide x 40" front walkway elevation; provide for clearance around accessible wheelchair spaces.
7. Fully closed deck with 8/24 rise/run.
8. Hot dip galvanized and painted (paint is optional), color as selected by architect and school administration.
9. Powder coated aluminum risers, architect to select color from standard colors.
10. Black vinyl coated 9-ga chain link fence.
11. Provide (4) Wheel chair accessible ramps – (2) straight ramps along the front and (1) ramps at each end of the front walkway.
12. (13) Minimum wheelchair spaces with companion seats at front walkway; comply with FBC.
13. Provide (6) fully closed aisles with center aisle handrails.
14. Provide continuous guard safety and handrail system.

1.4 REFERENCES

A. AAMA 603.8 - Voluntary Performance Requirements and Test Procedures of Pigmented Organic Coatings on Extruded Aluminum

B. ACI 318 – Building Code Requirements for Structural Concrete

C. ASCE 7 – Minimum Design Loads for Buildings and Other Structures

D. ASTM A36/A36M – Standard Specification for Carbon Structural Steel

E. ASTM A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

F. ASTM A572/A572M – Standard Specification for High Strength Low Alloy Columbium Vanadium Structural Steel

G. ASTM A615/A615M – Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

H. NFPA 102: Standards for Grandstands, Folding and Telescopic Seating, Tents and Membrane Structures

I. FBC - Florida Building Code
J. AISC Steel Construction
K. American Welding Society
L. FFPC - Florida Fire Prevention Code

1.5 DESIGN CRITERIA

A. General:
1. Provide proper temporary bracing for the structure s to handle wind and construction loads until all permanent structural elements securely in place.
2. Individual stringer columns not allowed.
3. Provide cross brace lateral and longitudinal bays.
4. Guardrails shall be of adequate size, location, and height to meet specified codes and designed to carry required loads.
5. Provide completely closed exit stair risers and intermediate aisle stair risers in the direction of travel, and with a maximum rise of 7" and a minimum tread of 11".

B. Code Compliance:
1. Base the submittals upon specifications contained in the bid documents.
2. Provide interpretation of code compliance for life safety issues in design documents.
3. Any change to design must have approval prior to bid.
4. Do not change the design to reduce aisles or exits.
5. Do not change the Design to seat board bracket support.
6. Calculations that demonstrate code compliant egress and exit of aisles, stairs, and ramps is a required submission with approval drawings.
7. Structure is a threshold building and must be inspected accordingly.

C. Deflection: Size all structural elements to limit the live load deflections to 1/200 of the span.

D. Foundations:
1. Size foundations based on soil bearing capacity of 2500 lb. / sq. ft., unless directed by the Engineer of Record.
2. The Architect/Engineer shall verify soil-bearing capacity prior to placement of footings.
3. Do not reduce foundation sizes indicated on drawings under any circumstance.
4. Do not downsize or redesign the Engineer's foundation requirements.

E. Design Loads:
1. Live Load: 100 PSF gross horizontal areas
2. Perpendicular Sway Load: 10 PLF of seat plank
3. Lateral Sway Load: 24 PLF of seat plank.
4. Wind Load: ASCE 7, Risk Category III, Exposure C.
5. Live Load for Seat and Tread Planks: 120 PLF.
6. Handrail and Guardrail loads:
a. Concentrated loads: 200 Lb. Applied at any point in any direction
b. Uniform Loads: 50 PLF horizontally and 100 PLF vertically

1.6 SUBMITTALS

B. Samples
1. Seat board
2. Footboard
3. Riser board
4. Handrail support post and cap
5. chain link fencing
6. Deck attachment support member
7. Deck members with internal splice/expansion sleeve
8. Intermediate step

9. Seat mounting bracket - “L” type to meet FBC and NFPA codes
10. Thermoplastic polyester resin powder coat protection for steel and aluminum
11. Assembled chair
12. Seat mounting bracket
13. Color chips
14. Seat module with fasteners

C. Provide seating plan, indicating aisles, walkways, seating sections and exits.
   1. Occupant loads and egress calculations and egress plan.
   2. Number of exits shall be as required by FBC & FFPC.

D. End elevation and section indicating rise and row depth, deck configurations, railings, size of framing members and walkways.

E. Provide calculations by a Florida Professional Engineer verifying compliance with ASCE 7.

F. Obtain approval of all drawings and calculations by the SDPBC Building Department prior to fabrication and installation.

1.7 QUALITY ASSURANCE

A. Manufacturer shall have a minimum of 10-years of experience in fabrication of grandstand structures.

B. Engineering Qualifications:
   1. A Florida Professional Engineer shall design the Grandstand, and all submittals shall bear the PE's seal.
   2. Calculations are required, must show all vertical and lateral loads, and must show positive and negative biaxial stress ratios.
   3. Submit the calculations with the drawings to the building department.
   4. Do not reduce or change the steel sizes and foundation shapes and sizes.

C. Product Liability: Provide Detailed Certificate of Insurance, including products/completed operations insurance.

D. Warranty:
   1. Provide 1-year product guarantee for date of written acceptance against defective materials and workmanship.
   2. 11-months from written acceptance, Contractor/Installer shall inspect with Owner the structure to identify and repair any warranty items, and to retighten any lose connections.
   3. Damage resulting from abnormal use, vandalism, or incorrect installation (if installed by other than authorized installer of the manufacturer) is not applicable.

E. Any Coating System Applicator other than the grandstand manufacturer shall specialize in the specific coating system application with a minimum of 10-years experience.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Listing as acceptable manufacturer does not remove responsibility to meet specifications
   1. Southern Bleacher Co, Graham, TX
   2. Dant Clayton Corp., Louisville, KY
   3. Outdoor Aluminum, Geneva, Al.
   4. Surdisteel, Waco, TX
   5. E & D Specialty Stands, North Collins, NY
   6. Pre-approved equal

2.2 MATERIALS

A. Structural Steel

1. All detailing, fabrication, and erection shall be in accordance with AISC Specifications.
2. Structural steel shall be ASTM A572/A572M multi-certified grade 50, hot dip galvanized per specification section 05 12 00.
3. Miscellaneous steel shall be ASTM A36/A36M, galvanized per section 05 40 00.
4. All bolts ½" diameter and larger shall be ASTM A325, galvanized.
5. Threaded rod shall be ASTM A36/A36M, galvanized.
6. All welds shall conform to ANSI/AWS D1.1, latest edition.
    a. Electrodes shall be E70XX.
7. Columns shall be wide flange shapes.
8. Support beams shall be wide flange shapes.
9. Stringer shall be wide flange shape.
10. Structural Steel Coating
    a. Painted Structural Steel
        i) All structural steel material shall be hot-dipped galvanized then immediately painted.
        ii) Finish coat shall be one coat low VOC thin film, two-part polyurethane, International Interthane 990H or equal, 2.0-3.0 mils dry-film thickness.
        iii) The Owner or Architect shall have open access to manufacturing facilities before and during the painting of materials covered by the specifications and plans.
11. Clean and repaint all field cuts with one coat zinc-rich primer and one coat finished paint to match.

B. Guard and Handrail System
1. Guards shall be anodized, extruded aluminum pipe of 6061-T6 alloy, 1⅝" O.D.
2. Guard supports shall be aluminum tube 2.8" x 2.0" x 0.1875", and shall be 6061-T6 alloy.
    a. Guards shall have structural support on each leg of the fencing at all 90° turns.
    b. Tension bands do not meet this requirement.
3. Two-line center aisle handrails shall be anodized extruded aluminum pipe of 6061-T6 alloy, 1½" O.D.
    a. Rails shall be discontinuous and spacing between rails shall be not less than 22" or more than 36".
    b. Rails shall not span more than 5-rows of seating.
4. Chain link fence shall be 2: mesh, 6-gauge black vinyl-coated fabric.
5. Handrails shall be 1½" outside diameter and provide 1½" clearance from the guard in-fill material and shall extend 12" past the last riser with a return.
    a. Newel posts and intermediate supports will not interrupt handrail.
6. All vertical aluminum guard supports will have cast aluminum safety top cap.
7. All edges and exposed parts shall be free of sharp edges.

C. Seating
1. Seats shall be comfort design 6063-T6 extruded aluminum with a fluted surface and a minimum of 4 vertical legs.
    a. The exact size of seat board is 2” x 10” with waterfall front edge.
    b. Aluminum shall be clean, pre-treated, and clear anodized.
2. Mounting brackets shall be galvanized ASTM A36/A36M steel.
3. Seat boards in the upper seating section shall attach to structural by use of steel “L” mounting brackets aligning with the intermediate steps.
    a. Seats in the lower section shall be tread mounted “Z” brackets.
    b. The “L” mounting brackets shall attach to vertical rise with galvanized bolts that provide structural connection with no cavity in vertical riser.

c. Tek screw or self-tapping bolts - expressly prohibited for “L” bracket attachment.

D. Welded Decking System
   1. Floor Deck on grandstand shall be an all-aluminum, maintenance-free, corrosion-resistant deck.
      a. There will be no gaps between the longitudinal joints of the decking.
      b. Decking shall be of such rigidity and reinforcing that no "oil-canning" of decking materials will occur.
      c. The walking surface shall consist of a closed aluminum deck and be fluted for safety, with concealed fasteners for the tread.
      d. The decking systems extrusions will be 6063-T6 aluminum alloy, mill finish, with a wall thickness of 0.078".
      e. The bottom leg of the front extrusion of the tread will contain a female valley.
      f. This valley so designed to accept a male portion of an extruded riser plate from below.
      g. The back portion of the decking will be an extrusion design of such height as to create sufficient overlap with the riser plate for the attachment of connection hardware.
      h. The transition from vertical riser to horizontal decking shall be 5/8”-3/4” radius curve to prevent trash accumulation.
      i. The decking members will interlock via tongue and groove prior to welding to increase rigidity and limit deflection.
      j. Oversized non-slip anti-skid flutes are required to reduce loss of traction and increase coefficient of friction.
   2. The riser is to be an extrusion of 6063-T6 aluminum alloy, 0.078" wall thickness that has a male ridge running continuous at the top edge so designed that it will interlock into the front bottom of the nosing extrusion on the tread.
      a. The riser shall be of sufficient overall height and adequately lap the vertical projection of the back lower tread extrusion.
      b. Aluminum shall be clean, pre-treated and powder coated with a thermal setting polyester resin in accordance with Architectural Aluminum Manufacturers Association specification AAMA 603.8
   3. Construct the deck system of the nose and back tread aluminum extrusion with various extruded sections placed between these two extrusions and located side by side.
      a. Weld the decking system in a single pass with 0.040" diameter 4043 welding wire, creating a welded seam, one-piece tread panel in a minimum length of 18'-0", not to exceed 37' 6".
      b. Field welding will not be acceptable.
      c. Clamp the deck assembly to the support structure and fixture with a one-percent slope to the front for water drainage.
      d. The connecting hardware shall be concealed and attached by use of aluminum bolt clips with 5/16" hot-dipped galvanized, after fabrication, steel hardware.
      e. The through bolting of decking material not allowed.

E. Ramps and Ramp Platforms
   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 with aluminum safety top cap.
   2. Ramp deck shall be 6063-T6 extruded aluminum with a fluted surface and a minimum wall thickness of 0.078".
      a. Minimum vertical thickness of treads shall be 1.75" actual.

b. Finish shall be mill finish.

3. Ramp and ramp platform treads shall mate via tongue-and-groove design 1.75" actual dimension and a minimum wall thickness of 0.078 measured between the flutes.
   a. All ramp footboards will run perpendicular to the direction of travel, to ensure proper function of anti-skid flutes.
   b. Handrails shall be as specified herein.
   c. Ramp configuration and quantity shall be as shown on the drawings.
      i) The slope of the ramp shall be a maximum of 1" vertical to 12" horizontal with intermediate landings at turns or 30'-0" maximum spacing.
      ii) There shall be a minimum clear distance between support channels of 60".
      iii) The ramp shall land on concrete threshold.

F. Stairs, Stair Platforms and Intermediate Steps
   1. Frames and stringers shall be A36 steel channel-finished to match the grandstand structural steel.
   2. Treads shall be 6063-T6 extruded aluminum with a fluted surface and a minimum wall thickness of 0.078".
      a. Minimum vertical thickness of treads shall be 1.75" actual.
      b. Treads shall be mill finish.
   3. Provide risers fully closing the stairs in all directions of travel.
      a. Risers shall be clean, pre-treated and powder coated with a dry thermoplastic polyester resin in accordance with AAMA 603.8
   4. Stairs will land on concrete threshold.
   5. Intermediate steps in vertical aisle stairs will divide the rise and run in half, ± 3/16" for code compliance.
      a. Intermediate aisle stairs will not create a trip hazard within the 12" required aisle access way in a row.
      b. Intermediate steps in vertical aisle stairs that create a vertical change in aisle access way are strictly prohibited.
      c. There will be no variance allowed for tread depth to exceed ± 3/16".
   6. All bolts used for field installation shall be steel, hot dipped galvanized after fabrication.
   7. Intermediate aisle stair tread will be in line with seat boards in section view and plan view.
      a. Half steps that require step up to aisle strictly prohibited.
   8. All aisle access ways will have 12" clear and level access to vertical aisle stairs.

G. End Caps
   1. Walkways, footboards, and aisle board end caps shall be one-piece mill finish aluminum angle design tumbled after fabrication to remove burrs and sharp edges.
      a. End caps shall be riveted to the planks.
   2. Seat board end-caps shall be one-piece cast aluminum and shall be friction-fit to the plank without the use of mechanical fasteners.
   3. Cover handrail posts with cast aluminum top caps.
   4. Provide splice plates at all perpendicular seams in load bearing deck members to maintain alignment of decking members during expansion/contraction.
      a. All seams shall occur at structural steel supports.
      b. Provide joint covers at end panel butt joints.
      c. Fasten covers to the internal sleeves.

2.3 Wheelchair Areas

A. Enclose wheelchair-seating areas on all sides with a guard.

1. Open vertical rise not allowed in the wheelchair area.

B. All wheelchair spaces will have seating in pairs of two.
1. All wheelchair seating will have adjacent companion seat.

2.4 Reinforced Concrete
A. All concrete work and materials shall be in accordance with ACI 318.
B. Cast-in-place concrete shall have minimum compressive strength of 3,000 PSI at 28 days.
C. All exterior concrete shall be air-entrained to 6% ± 1%.
D. Reinforcing steel shall be in accordance with ATM A615/A615M, grade 60.
E. Embedment of reinforcing in concrete shall be as follows, unless otherwise noted on drawings:
1. 3" Placed directly against earth
2. 2" Concrete poured against forms and exposed to weather
3. 1½" Columns to ties

PART 3 EXECUTION

3.1 EXAMINATION
A. Examine site conditions, with Installer present, for compliance with requirements for construction and installation requirements as they affect work specified herein.
B. Do not proceed until unsatisfactory conditions correct.

3.2 INSTALLATION
A. Installation shall be directly by the manufacturer or by a factory-certified installation subcontractor, subject to compliance with state licensure laws.
B. Erect the structure in accordance with plans, shop drawings, and specifications.
C. Erect the chairs and bench seating in accordance with plans, shop drawings, and specifications.
1. When installed, configure the chairs to provide maximum number of 19", 20", or 21" units.
D. Coordinate the installation with press boxes and required elevators and stair towers

3.3 ADJUSTMENT
A. Correct, repair, or replace any defective workmanship or damaged components, as requested by the Architect, without further cost to the Owner.

3.4 CLEANING
A. Clean all surfaces after erection, in accordance with manufacturer's recommendations.
B. Remove and properly dispose of all packaging and construction debris.

END OF SECTION