SECTION 13 34 16 – Tube and Welded Angle Frame Grandstands

PART 1 – GENERAL

* 1. RELATED DOCUMENTS

	Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification sections, apply to the work of this section.
	2. SCOPE OF WORK

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

		1. 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. Bleacher designed to be anchored to concrete pad
			4. The overall length of grandstand shall be as per architectural drawings.
			5. The number of rows shall be as per architectural drawings.
			6. Height of front cross aisle from grade shall be 32” as shown on drawings.
			7. Width of front walkway to be 78” as shown on drawings.
			8. The rise per row shall be \_\_” as shown on drawings.
			9. The depth per row shall be \_\_” as shown on drawings.
			10. Net seating capacity shall be as shown on architectural drawings. \_\_\_\_ @ 18” per seat, plus \_\_\_ Venue I self-rising chairs @ 20” per seat, plus \_\_ wheelchairs @ 33” per seat.
			11. ADA seating shall be as shown on architectural drawings.
			12. Aluminum extrusions using alloy 6063-T6 and 6061-T6.
			13. The understructure of the system shall consist of a series of aluminum frames spaced at intervals of no more than 6’-0” and joined by means of aluminum sway braces.
			14. All welded connections shall be by certified aluminum welders.
			15. Aisle and egress stairs shall have a ½” overlap.
			16. Minimum of 2”x2”x1/8” square tube vertical understructure components.
			17. Aluminum panel closure panel along the length of the grandstand to within 2” of grade. Clear anodized or powder coated.
			18. Guardrail system shall consist of all-aluminum guardrail posts and railings with galvanized or vinyl coated chain link fencing.
			19. Grandstand manufacturer must have a written quality control program for manufacturing, shipping and installation.
			20. Walking surface shall be ANSI compliant, fluted and slip-resistant. This walking surface shall meet the criteria of ADA and OSHA.
			21. Press box shall be per architectural drawings, \_\_’ wide x \_\_’ long with entry platforms extending from the end aisles.
			22. Press box shall be a/an \_\_\_\_ Industrialized unit and bear PPS label.
			23. Failure to provide any of the following will disqualify bid:
				1. Proper rise per row
				2. Proper depth per row
				3. Proper number of rows
				4. Proper length
				5. Proper height of front walkway to grade
				6. Proper number of net seats
				7. Proper number of handicap areas
				8. Aluminum seat supports
				9. No gaps or cavities between the riser portion of the decking system and any supports or attachments.
				10. Aisle and Egress stairs shall have a ½” overhang.
				11. Beveled aluminum thresholds.
				12. Press Box shall be State of \_\_\_\_\_\_ industrialized unit and shall bear PPS Label.
				13. Written quality control program.
				14. Venue I or equal self-rising chairs.
				15. Copy of AISC Steel Plant Certification.
				16. Drawings showing layout and seating plan for proposed bid.
				17. Aluminum closure panel to grade.
		2. Related sections include the following:

			1. Division 3 Section “Cast-in-place concrete” for concrete mix design and testing requirements.
	3. SYSTEM PERFORMANCE REQUIREMENTS

		1. 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.
		2. Structural performance: Provide a 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
				1. Dead Loading: 6 PSF for understructure.
				2. Live Loads: 100 PSF for understructure.
				3. Deflection Limits: Engineer assemblies to withstand design loads with deflections no greater that the following:

Stringers: Vertical deflection of L/240.

* + - 1. Design Loads / Decking System
				1. Dead Loading: 6 PSF for decking, platforms, stairs and ramps.
				2. Live Loads: 120 PSF for decking, platforms, stairs and ramps.
				3. Deflection Limits: Engineer assemblies to withstand design loads with deflections no greater than the following:

Decking, platforms, stairs and ramps: vertical deflection of L/360.

* + - * 1. Sway loads of 24 PLF per row parallel to seat and 10 PLF per row perpendicular to seat run.
			1. Design Loads / Handrails / Guardrail
				1. 100 PLF vertical.
				2. 50 PLF applied in any direction at the top.
				3. 200 LF concentrated load any direction.
				4. 50 PSF fencing and guardrail infill.
			2. Design Loads / Seat Boards
				1. Live Loads: (vertical), 120 PLF (pounds per lineal foot).
	1. SUBMITTALS

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

			1. Foundations:
				1. 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. Structural framing: Primary and secondary framing, including but not limited to the following:
				1. Vertial and Horizontal Members
				2. Bracing
				3. Connecting Hardware
			4. Semi-Closed Decking System:
				1. Decking
				2. Risers
				3. Supports for seats
				4. Aisle steps
				5. Aisle handrails
				6. Egress stairs
				7. Hardware
			5. Seating
			6. Handrails / Guardrails
			7. Ramps
			8. Press Box
		2. Proposal Drawings: Submit with bid proposal the following schematic design plans:
			1. Plan showing general design and seat locations.
			2. A decking and aisle layout plan

Note- Failure to provide this documentation will result in a rejection of bid.

* 1. QUALITY ASSURANCE

		1. 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 the grandstand manufacturer.
		2. Erector Qualifications: An experienced erector who has specialized in erecting and installing grandstands similar in material and 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 the grandstand manufacturer.
		3. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the 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 drawing shall bear the seal of a registered professional engineer in the state of installation.
		4. Quality Control: Manufacturer’s written quality control for manufacturing, shipping and installation shall be submitted prior to award of contract.
		5. Standards and Guidelines: Comply with the provisions of the following codes, specifications and standards, latest editions, except as otherwise noted or specified:
			1. American Concrete Institute (ACI)
			2. American Institute of Steel Construction (AISC)
			3. American Welding Society (AWS)
			4. Americans with Disabilities Act (ADA)
			5. Underwriters Laboratory (UL)
			6. National Electric Code (NEC)
			7. International Building Code (IBC)
			8. State Code Here
			9. International Code Council (ICC-300) for Grandstands
		6. Site visitation: Bidder shall visit the job site ten (10) days prior to the bid date. At the time of visitation, bidder must announce himself to the owner’s representative.
	2. DELIVERY, STORAGE AND HANDLING

		1. 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.
		2. Grandstand materials must not be stored where they would come in contact with other materials that might cause staining, denting or other surface damage.
	3. WARRANTY

		1. 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

* 1. MANUFACTURERS
		1. The basis of design is Outdoor Aluminum, Inc., 1902 Brooke Stone Court, Crestwood, KY 40014: 800-609-1545. Other manufacturers requesting to bid shall be approved by written addendum at least ten days prior to bid date. Listing as acceptable manufacturer does not remove responsibility to meet specifications. Owner or Architect must receive written request fifteen (15) days prior to the bid date, for review and action on request.
		2. Other Acceptable Manufacturers
			1. (List manufacturers here)
	2. CONCRETE FOUNDATIONS

		1. Foundations shall be designed in accordance with mix designs per Section 03310 – Concrete Work.
		2. Foundations shall be based on a subsurface exploration report furnished by the Architect/Owner.
	3. **STRUCTURAL – FRAMING MEMBERS**
		1. The understructure of the system shall consist of a series of aluminum frames spaced at intervals of no more than 6’-0” and joined by means of aluminum sway braces.
		2. Each stringer shall consist of vertical members, adequate diagonal braces, and horizontal members welded to form a \_\_\_\_\_\_” rise per row and a \_\_\_\_\_” back to back spacing between seat rows.
		3. All welded connections shall be by certified aluminum welders, and all mating parts shall be welded on all sides to assure adequate strength.
		4. Vertical members shall be constructed of a minimum 2” x 2” x 1/8” square tube aluminum, alloy 6061-T6, mill finish.
		5. Horizontal members shall be constructed of a minimum 2” x 1.5” x 3/16” aluminum angle, alloy 6061-T6, mill finish.
		6. Sway braces shall be constructed of 1.5” x 1.5” x 3/16” aluminum angle, alloy 6061-T6, mill finish.
	4. DECKING SYSTEM

		1. Decking Arrangement:

			1. Deck shall consist of two pieces of nominal 2x10 planking, alloy 6063-T6, wall thickness .078” with raised flutes, mill finish.
			2. Seat and footboards shall be connected to the supporting structure so as to transmit all live and sway loads to the understructure members, so placed to resist those loads specified in the design section.
			3. Decking 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. Where splicing on the seatboards and decking is necessary, concealed dual sleeve inserts, fastened at one point only, shall be provided to maintain both horizontal and vertical alignment, while allowing for the continual expansion and contraction of the plank. Sleeves shall be of extruded aluminum, alloy 6063-T6, wall thickness .062” minimum, 18” in length and shall be mill finish.
		2. Decking System Riser

			1. The decking system riser shall be extruded aluminum, alloy 6063-T6 with a 204R1 anodized clear finish.
			2. Riser boards shall be provided under all seat rows.
			3. The riser shall be structurally connected to the understructure by means of concealed bolt clips. Tek screws or similar hardware is prohibited.
		3. Decking System Seat Supports

			1. The rise from one seat support to the next shall be \_\_\_\_\_\_”.
			2. The seats shall be attached by means of concealed bolt clips attached directly to the grandstand understructure.
		4. 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.
		5. 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 the 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 clear anodized or powder coated and fastened to the rear tail of the stair tread with ¼” diameter structural grade rivet.
			3. Contrasting stair tread nosing to be anodized aluminum 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.
		6. Decking System Hardware

			1. All bolts, washers and nuts shall be galvanized.
			2. End caps shall be of heavy duty, clamping, aluminum channel design fastened to the end 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.
	5. SEATING AND OPTIONS

		1. 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”. 1-1/2” by 9-1/2” plank is strictly prohibited.
			4. Seats shall attach to the decking system seat supports by means of concealed aluminum clips, galvanized bolts, lock 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.
		2. Closure panel

			1. The closure panel shall be constructed of aluminum risers and shall be installed the length of the grandstand along the front.
			2. The closure panel shall begin a maximum of 2” from grade.
			3. Finish of the closure panel shall be clear anodized 204R1 finish or powder coated per alternate. Color to be selected by owner/architect.
			4. Framing of the closure panel shall be of the manufacturer’s standard design.
	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.
	7. RAMPS

		1. Wheelchair accessible ramps with a minimum 60” clear width and a maximum 1:12 slope shall be provided, conforming to code.
		2. Understructure shall be constructed of same materials as grandstand support structure.
		3. Decking and handrails shall be constructed of same materials as grandstand decking.
	8. PRESS BOX – See Architectural Drawings (Drawing #\_\_\_). Insert press box specifictions here.

PART 3 – EXECUTION

1. EXAMINATION

	* 1. Before erection proceeds, certified grandstand installer will survey elevations and location of concrete foundations or pads and anchor bolts to verify compliance with the requirements of grandstand manufacturer’s tolerances.
	1. ERECTION

		1. Erect grandstand system according to manufacturer’s written instructions and erection drawings.
		2. Do not field cut, drill or alter structural members without written approval from grandstand system manufacturer’s professional engineer.
		3. Set structural framing in locations to elevations indicated according to AISC specifications referenced in the specification.
	2. CLEANING AND PROTECTION

		1. Clean all metal surfaces promptly after installation of work.
		2. Exercise care to avoid damage to protective coatings and finishes.
		3. Remove all excess construction material and dispose of all debris.

END OF SECTION 13 34 16