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**DIVISION 12**

**SECTION 12300 — MANUFACTURED CASEWORK**

**PART 1 – GENERAL**

**1.01 EXTENT OF SECTION**

- A. This Section outlines fabrication and installation of built-in laminate clad casework, custom casework, countertops, manufactured laboratory casework and appurtenances, including installation and related items specified herein.
- B. The intent of the PCSB STANDARDS is for the DESIGN PROFESSIONAL (DP) to comply with the minimum general project requirements and the specific project specifications shall be generated and provided by the DP.

**1.02 GENERAL**

- A. Extent of wood laboratory casework and fixtures is shown on drawings and includes the fabrication and installation of standard laboratory furniture components of base cabinets, wall cabinets, storage cabinets, tables, cabinet understructures for fume hoods, shelf units and other units as indicated.
- B. Tops, sinks, accessories and mechanical and electrical service fixtures common to laboratory casework are included as work of this section.
- C. Service fixtures are supplied as part of this work. Installation of service fixtures is included under mechanical work of Division 15 and electrical work of Division 16.
- D. Furnishing and Installation of services, waste lines and traps are specified in Divisions 15 and 16. Work by other CONTRACTORS include, but not necessarily limited to: furnishing, installing and connecting of all service lines, drain lines, internal piping and conduit within equipment and fume hoods and service turrets or tunnels under or along the backs of work surfaces as required, furnishing, installing and connecting all duct work from fume hoods to blowers and from blowers to final point of discharge to atmosphere. Furnishing and installing and connecting all vents, re-vents, stem fittings, special plumbing fixtures or plumbing to meet codes even though not specifically called for in the specifications or shown on the drawings. Furnish and install all rigid and flexible conduit, wire and pulling of wires, fittings and special electrical equipment and accessories including boxes, receptacles and flush plates set loose. Included are those in box curbs or tops which are not installed and equipment in contractor's plant due to inconvenience of shipping. All shall be in accordance with electrical codes. Wiring and connection of switch to fume hook, lights and blower motors shall be included.
- E. Verify site dimensions of cabinet locations in building prior to fabrication.

**1.03 SUBMITTALS**

- A. Product Data: Submit manufacturer's data and installation instructions for each type of laboratory furniture unit. Include independent laboratory certification that applied finish complies with specified chemical and physical resistance requirements.



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- C. Samples: Submit 6-inches x 6-inches samples of specified finishes, including top material. Samples shall be reviewed by the DP for color, texture, and pattern only. Compliance with other specified requirements is exclusive responsibility of manufacturer.
1. Submit one full-size sample of finished base cabinet unit complete with hardware, doors and drawers without finish top.
  2. Submit one full-size sample of finished wall-mounted cabinet unit complete with hardware, doors and adjustable shelves (for viewing only, shall be returned to manufacturers).
  3. Where applicable, furnish both hinged and sliding door samples.
  4. Submit full-size samples of sink units and accessories when requested by the DP.
  5. Submit samples of mechanical and electrical service fixtures when requested by the DP, complete with fittings and accessories with specified finish.
  6. Deliver to contractor's field office. Acceptable sample units shall be used for comparison inspections at project. Unless otherwise directed, acceptable sample units may be incorporated in work. Notify the DP of their exact location. If not incorporated in work, retain acceptable sample units in building until completion of work. Remove sample units from premises when directed by the DP.

**1.04 SHOP DRAWINGS**

- A. Submit shop drawings for laboratory furniture showing plans, elevations, ends, cross-sections, service run spaces, location and type of service fixtures with lines thereto. Show details and location of anchorages and fitting to floors, walls, and base. Include layout of units with relation to surrounding walls, doors, windows, and other building components.
- B. Coordinate shop drawings with other work involved.
- C. Prior to submitting formal shop drawings, contractor shall submit rough-in drawings. These drawings must be reviewed and approved by mechanical, plumbing and electrical subcontractors prior to submittal of final shop drawings.

**1.05 QUALITY ASSURANCE**

- A. SINGLE SOURCE RESPONSIBILITY: Provide laboratory casework with tops, sinks, and service fixtures, manufactured or furnished by same company for single responsibility.
- B. CATALOG STANDARDS: Manufacturer's catalog numbers may be shown on drawings for convenience in identifying certain laboratory cabinet work. Unless modified by notation on drawings or otherwise specified, catalog description for indicated number constitutes requirements for each such cabinet. The use of catalog numbers, and specific requirements set forth in drawings and specifications are not intended to preclude the use of any other acceptable manufacturer's product or procedures which may be equivalent, but are given for purpose of establishing standard of design and quality for materials, construction and workmanship.

**1.06 PRODUCT HANDLING AND STORAGE**



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- A. Deliver laboratory furniture only after wet operations in building are completed.
- B. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.

**PART 2 – PRODUCT**

**2.01 MATERIALS**

- A. GENERAL: All material shall be the best of their respective kinds for the purpose intended and all methods used in construction shall conform to the best practices of the Scientific Laboratory Equipment Industry, including any specialized materials required.
- B. WOODS: All woods shall be carefully and thoroughly air-dried; then kiln dried by the laboratory equipment manufacturer in their own humidity controlled kilns to a moisture content of 4½ percent, Temper kiln dried lumber to a moisture content of 6 percent before use. Maintain moisture content throughout production.
- C. EXPOSED SURFACES: Provide oak for all exposed exterior casework surfaces, the exposed interior ends, top and bottom of open cases or cases having glazed doors.
  - 1. Backs: Provide printed hardboard backs finished to match interior.
  - 2. The solid woods used for exposed surfaces shall be clear and graining in conformance with the normally accepted standards required of the Scientific Laboratory Equipment Industry. The finished installation shall provide an attractive and harmonious appearance.
  - 3. Exposed Plywood: Provide oak faced veneer or solid wood core plywood used for exposed exterior surfaces, exposed interior ends, top and bottom of open cases, or cases having glazed doors, of the thickness as described under construction.
  - 4. Plywood used for doors under 48-inches high shall be ¾-inch thick core with cross bands of 1/20-inch Poplar, exterior face of 1/32-inch thick plain sliced Select Grade 1 Oak and back face of 1/32-inch thick sound Oak. Use of particleboard as a core is acceptable in dry areas only.
  - 5. Doors over 48-inches high shall be hollow core, hardwood framed, 1-inch thick with same veneer construction as solid doors.
  - 6. Interior Plywood: Provide Poplar Grade A veneer face, Grade B back for all interior plywood used in cabinets and cases, unexposed. All interior plywood shall have high grade veneers and assembled with poly-vinyl emulsion glue.
  - 7. Provide 7-ply poplar plywood with oak banding for all interior unexposed shelves.
  - 8. Glass: Provide 1/8-inch thick glass for swinging or sliding framed doors and 1/4-inch thick glass for sliding, wall-hung, unframed doors. All glass shall be safety or tempered glass.

**2.02 MOBILE CABINET DESIGN AND CONSTRUCTION:**

- A. All mobile cabinets shall be designed with a structurally layered base, bolt plate-type casters.
- B. Plywood construction shall be used. No exposed fasteners.



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- C. Design profile shall allow doors to swing open a full 270 degrees and overlay cabinet sides.
- D. Unit top shall be edged with 3 mm PVC/ABS and overhang case front, back and sides to function as a bumper system.

**2.03 INSTRUMENT STORAGE CABINETS:** Modular components in 21-inches (533 mm) or 27-inches (686 mm) widths as detailed, inset door design. Compartment sizes and arrangements shall be as shown on DP's and manufacturer, by LSI Corporation of America, Inc., drawings. Manufacturers shall submit sample of instrument storage cabinet for approval. Samples may be retained by OWNER until completion of project for verification and compliance with DP's Design and Construction Documents.

- A. **CABINET BODY:**  $\frac{3}{4}$ -inch (19.1 mm) core as specified in Materials. Back panel  $\frac{1}{2}$ -inch (12.7 mm), recessed and structurally bound (dadoed) all four sides of cabinet body, secured with toe-nailed mechanical fasteners and sealed with full-perimeter high-strength hot-melt adhesive and  $\frac{3}{4}$ -inch (19.1 mm) thick rear stiffeners. Interior body surfacing, whether open or closed door cabinet, including sides, rear, and shelf underbody, shall be pressure fused thermofused melamine laminate, Cear. Toe base shall be separate and continuous platform of exterior grade plywood of front, back and intermediates for continuous support and moisture resistance.
- B. **FIXED SHELF SYSTEM:** LSI ProtectorShield™ high-impact, molded system with continuous  $\frac{1}{2}$ -inch wide x  $\frac{1}{4}$ -inch deep (12.7 mm x 6.4 mm) ventilation grooves, solid core, and integral  $1\frac{1}{4}$ -inch (32 mm) diameter 180 degree full-radiused front nosing. Shelf shall be  $1\frac{1}{4}$ -inch (32 mm) total thickness, fixed to cabinet/divider sides with continuous offset channels to retain and support the shelf. Color, Cear to match other interior components. Vandal resistant, removable only by authorized personnel.
- C. **RELOCATABLE SHELF SYSTEM:** Shelves, unless divider-attached, shall be designed to be relocatable by facilities personnel. Cabinet bodies shall be factory pre-drilled to accept continuous shelf channel, relocatable to  $1\frac{1}{4}$ -inch (32 mm) increments. Shelf system remains vandal resistant.
- D. **HEAVY WEIGHT SHELF SUPPORT:** Provide  $1\frac{1}{4}$ -inch (32 mm) by  $1\frac{1}{4}$ -inch (32 mm) 14 gauge steel tubing under all shelves in cabinets 36 inches (914 mm) wide and wider, structurally fastened to cabinet end panels, and shelf. Cear epoxy powder coat to match other interior components.
- E. **DOORS:** Refer to drawings for type, swing, and location. All doors shall inset flush between cabinet/compartments end panels.
  - 1. **GRILLE DOORS:**  $\frac{5}{16}$ -inch (7.9 mm) perimeter/reinforcing, and  $\frac{3}{16}$ -inch (4.8 mm) interior vertical wire. Door and welded .095 inch (2.4 mm) hinges in Cear epoxy powder coat.
  - 2. **SOLID LAMINATE DOORS:** Balanced construction with .028 inch (.71 mm) high-pressure plastic laminate exterior, high-pressure cabinet-liner interior,  $1\frac{3}{16}$ -inch (20.6 mm) total thickness. Laminate surface/balancing liner to core under controlled conditions, by approved and regulated laminating methods to assure a premium lamination. Natural-setting hybrid P.V.A. Type III water resistant adhesives that cure



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through chemical reaction, containing no health or environmentally hazardous ingredients, are required.

3. **HINGES:** Five knuckle safety tip hinge with 2<sup>3</sup>/<sub>4</sub>-inch (69.9 mm) barrel, heavy gauge .095 inch (2.4 mm) with non-loosening specially designed furniture screw attachment. Non-binding design shall allow 180 degree door swing. Finished in Clear epoxy powder coat.
4. **HASP:** Hasp system shall be of one piece construction, no moving parts. Hand grip shall be minimum 7<sup>3</sup>/<sub>4</sub>-inch (196.9 mm) U-shaped of welded 5<sup>5</sup>/<sub>16</sub> inch (7.9 mm) rod. Hasp body plate shall contain padlock hole of sufficient size to accommodate all typically available combination/key padlock. Clear epoxy powder coat. Provide integral nylon stop for door-stop. Provide pre-numbered labels and white cover for owner placement.
5. **EDGING:** Cabinet Body Edging shall be high-impact, color-thru 3 mm PVC/ABS, length radiused both sides. Door Edging shall be high-impact, color-thru 3 mm PVC/ABS, length radiused and corner radiused inside and outside. Edging shall be hot melt applied, trimmed, radiused and buffed by singular automatic machinery for consistency. No exceptions. Choice of 30 manufacturer's standard colors.
6. **WORKMANSHIP:** Premium standards of consistent reveals, bevels, and edge treatments. No exposed mechanical body fasteners. Color choices at laminate door face and exterior exposed cabinet body end panels shall be over 200 manufacturer's standards. Instrument Storage Cabinets shall be shipped factory pre-assembled, including doors of either right or left mounting.

**2.04 HARDWARE AND TRIM**

- A. **Drawer and Door Pulls:** Provide drawer and door pulls of modern design, offering a comfortable hand grip and securely fastened to doors and drawers with vandal-proof screws. All pulls shall be satin finish aluminum, with a clear, lacquer finish. Provide two pulls on all drawers over 24-inches long. Use of plastic pulls (molded or extruded), or a design not compatible for usage by the handicapped shall not be acceptable.
- B. **Finish Pulls:** Provide satin finish chrome with recessed finger grip flush pulls for sliding doors.
- C. **Hinges:** Provide five (5) knuckle institutional hinges, offset type for all swinging doors. Hinges shall be 2 1/2-inches long, one (1) pair for doors under 4-ft. in height and 1 1/2-inches pair on doors over 4 ft. in height. Mount hinges with flathead screws, applied to door and cabinet to withstand a weight load of 150 lbs. minimum. Hinge finish: satin finish stainless steel.
- D. **Locks:** Apply locks to all doors and drawers as shown on the drawings or called for in the equipment list. All locks, for the purpose of coordinating keying systems, shall be *Illinois Lock Co.* offering two sets of four tumblers locking in opposite splines. Provide positive tumbler operation by cam action without the aid of springs. The lock system shall



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guarantee security which restricts the duplicating of keys to registered locksmiths. Exposed surface of locks shall match other cabinet trim.

- E. Magnetic Latches: Provide magnetic latches on all swinging doors. Enclose latches in a plastic case and operate against a strike plate on door. Provide latch on both leaves of double doors without locks. Provide full height cases with latching devices located on the structurally fixed center shelf. Provide a positive catch on left hand door and magnetic type latch on right hand door.
- F. Elbow Catches: Provide cadmium or chrome plated steel drawer stops on the inside back of each drawer, so designed as to prevent the accidental removal of the drawer.
- G. Leg Shoes: Provide 2½-inches high black pliable vinyl leg shoes on all table legs, unless otherwise specified, to conceal leveling device. Use of a leg shoe which does not conceal leveling device shall not be acceptable.
- H. Base Molding: Provide 4-inches high base molding of a pliable, black vinyl material with an adhesive backing. Secure molded plastic corner clips to all exposed corner.
- I. Support Rods, Upright Rod Assemblies and Rod Sockets: Provide anodized Duralumin upright rods, cross rods and ring support rods, when specified, (½-inch or ¾-inch dia., as required). Provide chrome plated brass rod sockets, secured through tabletops with lock nut and spring washer. Provide heavy-duty rod sockets, designed to securely hold rod assembly in any position. Use of wood rod assemblies shall not be acceptable.
- J. Label Holders: Provide self-adhesive type aluminum label holders, when specified, with satin finish, designed for 2 ½-inch x 1 ⅛-inch cards, unless otherwise indicated.
- K. Number Plates: Provide self-adhesive type aluminum number plates when specified with indented black lettering when specified.
- L. Leveling Devices: Furnish leveling devices only where shown or specifically called for, adaptable to table legs or the bottom corners of base cabinets. Device shall consist of a ½-inch dia. bolt threaded through a ½-inch tee nut which is securely screwed to bottom of leg, or to 1 ⅝-inch U-shaped 12 gauge metal bracket with leveling bolts mounted at the four bottom corners of a base cabinet. Provide cadmium plated steel bolts with a hexagonal head to provide bearing against a 12 gauge flat steel floor plate. Installed bolts shall be accessible for adjustment through cupboard bottoms and drawer openings when installed on base cabinet.
- M. Support Struts: Provide two 16 gauge channel uprights fastened top and bottom by two adjustable "U" shaped spreaders, each ⅝-inch x 1½-inch by length required. Furnish struts to support drain troughs and fume hood superstructures, or other abnormal loads. Where required, provide struts with hangers to support mechanical service piping drainlines. Provide in black acid resistant enamel finish.



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- N. Shelves and Support Clips: Provide pin type corrosion resistant coated shelf support clips for mounting on interior of cabinet work, to retain shelves from accidental removal. Mortised standards are also acceptable. Shelves are adjustable on 2-inches centers. Surface mounted metal support strips and clips subject to corrosion are not acceptable. **Shelves in units designed to store chemicals or in rooms that contain chemicals are to have ½-inch raised front lip.**

**2.05 WOOD CASEWORK FINISH AND PERFORMANCE REQUIREMENTS**

- A. WOOD FINISH: Prior to application of the wood finish, sand case and cabinet surfaces to remove loose fibers, scratch marks and abrasions. Thoroughly remove all dust removed by compressed air.
- B. WOOD FINISH APPLICATION: Apply finishes under controlled atmospheric conditions, cured after application in a modern humidified oven at 140 degrees F. and 30 percent relative humidity.
- C. WOOD CASEWORK FINISH (INTERIORS): Provide interior surfaces and unexposed exteriors with a double-pass coat of resinous wood sealer. Wax drawer glides and keels after sealing.
- D. WOOD CASEWORK FINISH (EXTERIORS): Provide case and cabinet exposed exterior surfaces, including interiors of glazed cases and open shelving, with an acid, alkali, solvent, water and abrasion-resistant finish. Coat surfaces with a non-fiber lifting stain, or toner to secure the desired color and thoroughly dried. The first sealer coat shall be applied, thoroughly dry, sanded and carefully dusted with tack rags. Apply a second sealer coat and thoroughly dry. Apply a double pass coat of chemical resistant synthetic varnish and thoroughly dried, providing a semi-gloss finish.

**2.06 CASEWORK COUNTERTOPS**

- A. Molded Epoxy Resin (Kemresin) Tops
1. Molded from a modified epoxy resin that has been especially compounded and cured to provide the optimum physical and chemical resistance properties required of a heavy-duty laboratory tabletop.
  2. Tops and Curbs: Provide a uniform mixture throughout thickness. Tops and curbs shall be non-glaring and black in color. Provide 1-inch thick tabletops, with drip grooves provided on the underside at all exposed edges. Provide all exposed edges except as indicated below, rounded to a ¼-inch radius at front top edge and at vertical corners. Integrally molded 4-inches high curbs at the backs and ends of standard 31-inches and 24-inches wide tops shall be ¾-inch thick, and the juncture between top and curb covered to a ¾-inch radius. Provide curbs on special width tops and around special cutouts of the same thickness as the tops, bonded to the surfaces of the top to form a square joint.
  3. Sink Cutouts: Smooth and uniform without saw marks and the top edge with a uniform radius of approximately ⅛-inch. Finish the bottom edge of the sink opening smooth





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with the edge broken to prevent sharpness. Radius corners of the sink cutouts not less than  $\frac{3}{4}$ -inch.

4. Provide, where indicated, indented table tops  $1\frac{1}{4}$ -inch thick at outer edge, indented  $\frac{1}{4}$ -inch to provide a raised rim  $\frac{5}{8}$ -inch wide around all exposed edges. Round the front top edge of the raised rim and exposed vertical corners of the top to a  $\frac{1}{8}$ -inch radius. Cove the juncture between the raised rim and the top surface to a  $\frac{1}{4}$ -inch radius.
- B. Impregnated welded fiber top (Kem Shield).
1. Temperede pressed wood finished with a highly resistant, baked on resinous coat.
  2. Tops and Curbs, see also SECTION 2.04.A6 above.
  3. Sink Cutouts, see also SECTION 2.04.A6 above.

**2.07 SINKS AND DRAIN TROUGHS**

- A. MOLDED EPOXY RESIN.
- B. Provide sinks of an especially modified epoxy resin, carefully compounded with selected materials to provide maximum physical and chemical properties. Provide non-glaring sinks, black in color with all inside corners coved and the bottom pitched to the drain outlet. Sinks shall possess a high resistance to mechanical and thermal shock.

**2.08 MECHANICAL SERVICE FITTINGS**

- A. Laboratory Service Fittings: Provide laboratory grade service fittings, with water faucets and valve bodies of cast red brass alloy or bronze forgings, with a minimum content of 85%. Provide chromium plated fittings unless specified otherwise. Use Chicago Faucet Co.
- B. Combination Fixture Water and Gas (Natural): Unicast Vandalgard fitting. Water fitting shall have the main body cast in one piece of 5A-ASTM-30 brass. Tubing shall not be a part of its structure. Body shall be carefully machined using standard valve seat, composition washer, upgrading screw threads and stem for hot or cold water. Operating handle shall be of Delrin plastic fitting with cold or hot water index. Entire fixture shall have beige color, baked plastic coating resistant to cleaning abrasions and reagent fumes. Provide a removable anti-splash outlet aerator. Fixture shall be fitted with a neoprene gasket and service from below with tail piece through the mounting service secured with locknuts.
- C. Ground Key Valve Hose Cocks: Provide ground key type valves with forged body and 10 serration hose end. Provide forged brass handle plug, long, tapered type with screw-on colored service index button. Individually ground, lap and seal valve.
- D. Gooseneck Type Outlets: Provide gooseneck outlets with a separate brazed coupling to provide a full thread attachment of antisplash, serrated tip or filter pump fittings.
- E. Service Indexes: Provide fittings identified with service indexes in the following color coding:



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<u>Service</u>	<u>Color</u>	<u>Lettering ID</u>
Hot Water	Red	HW
Cold Water	Dark Green	CW
Gas Dark	Dark Blue	GAS
Air	Orange	AIR
Vacuum	Yellow	VAC
Distilled Water	Cear	DW
Steam	Black	STM
Nitrogen	Brown	N
Oxygen	Light Green	02
Hydrogen	Pink	H
Special Gasses	Light Blue	(As Req'd)

- F. Electrical Fittings: Provide electrical fittings with 20 Amp., 125 Volt AC, 3-wire isolated grounded receptacles, unless other-wise specified. Provide aluminum pedestal and line-type boxes metallic finish with stainless steel flush plates and plated steel receptacle boxes. All electrical or conduit fittings shall be furnished under these Standards shall meet the requirements of the National Electrical Code. Service fixtures are indicated by type on the drawings. Provide stainless steel, Type 302, satin finish black cover plates. Provide ¼-inch high letters for cover plate identification for receptacles, switches, terminal posts and other locations indicated.
- G. Sink Outlets: Unless otherwise specified, provide molded epoxy resin sink outlets for other than stainless steel sinks, with gasket and lock nut with 1 ½-inch I.P.S. male straight thread outlet. Do not furnish overflows for sink outlets unless specifically called for. Furnish No. 0469-00 polypropylene trap and sink outlet assembly.
- H. Crumb Cup Stainers: Provide stainless steel or chromium plated brass crumb cup stainers as specified for stainless steel sinks, complete with gasket, lock nut and 4-inches long unthreaded tailpiece outlet in 1 ½-inch size.
- I. Vacuum Breakers: Provide "Nidel" or "Watts" vacuum breakers where required unless otherwise specified or identified to be an integral part of the water fixture assembly.
- J. Aerator Outlets: Furnish aerator type outlets for all gooseneck water faucets not furnished with serrated hose connectors.

**2.09 WARRANTY**

- A. The manufacturer shall guarantee all materials and workmanship provided for a period of one year from date of OWNER acceptance. Any defects due to the use of improper material or workmanship on the part of manufacturer occurring within that time shall be promptly rectified, by repair or replacement of the defective materials or correction of defective workmanship by manufacturer at his own expense, after notification by the OWNER.



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**SECTION 12300 — MANUFACTURED CASEWORK**

**PART 3 - EXECUTION**

**3.01 CASEWORK INSTALLATION**

- A. Install plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Where laboratory furniture abutts other finished work, scribe and apply filler strips for accurate fit with fasteners concealed where practicable.
- B. Base Cabinets: Set cabinets straight, plumb, and level. Adjust sub-tops within  $\frac{1}{16}$ -inch of a single plane. Fasten each individual cabinet to floor at toe space, with fasteners spaced 24-inches o.c. Bolt continuous cabinets together. *Provide inside sub-base pressure treated 2x4 blocks minimum 12-inches long secured to floor with no less than two "Tapcon" screw anchors fully into solid substrate.* After leveling, secure through base into these blocks. Secure individual cabinets with not less than 2 fasteners into floor, where they do not adjoin other cabinets. Where required, assemble units into one integral unit with joints flush, tight and uniform. Align similar adjoining doors and drawers to a tolerance of  $\frac{1}{16}$ -inch.
- C. Wall Cabinets: Securely fasten to solid supporting material, not plaster, lath, or wallboard. Anchor, adjust and align wall cabinets as specified for base cabinets. Reinforcement of stud walls to support wall-mounted cabinets shall be done during wall erection by trade involved, but responsibility for accurate location and sizing of reinforcement is part of this work.
- D. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- E. Workmen: Install casework under the supervision of the manufacturer's representative with factory-trained mechanics certified by manufacturer.
- F. Workmanship:
  - 1. Erect casework straight, level and plumb and securely anchor in place. Scribe and closely fit to adjacent work. Cut and fit work around pipes, ducts, etc.
  - 2. Install all items complete and adjust all moving parts to operate properly.
  - 3. Leave surfaces clean and free from defects at time of final acceptance.
- G. Guarantee: All materials shall be guaranteed for a period of 5 years from manufacturer's defects and workmanship.

**3.02 INSTALLATION OF TOPS**

- A. Field Jointing: Where practicable, make in same manner as factory jointing using dowels, splines, adhesives, and fasteners recommended by manufacturer. Locate field joints as shown on accepted shop drawings, factory prepared so there is no job site processing of top and edge surfaces.
- B. Fastenings: Use concealed clamping devices for field joints, located within 6-inches of front, at back edges and at intervals not exceeding 24-inches. Tighten in accordance with



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manufacturer's instructions to exert a constant, heavy clamping pressure at joints. Except for natural stone, composition stone and epoxy tops, secure tops to cabinets with "Z"-type fasteners or equivalent, using 2 or more fasteners at each front, end, and back.

- C. Workmanship: Abut top and edge surfaces in one true plane, with internal supports placed to prevent any deflection. Provide flush hairline joints in top units using clamping devices. At stone-type material joints, use manufacturer's recommended adhesives and holding devices to provide joint widths not more than  $\frac{1}{16}$ -inch wide at any location, completely filled and flush with abutting edges. Where necessary to penetrate tops with fasteners, countersink heads approximately  $\frac{1}{8}$ -inch and plug hole flush with material equal in chemical resistance, color, hardness, and texture to top surface. After installation, carefully dress joints smooth, remove any surface scratches, clean and polish entire surface. Provide holes and cutouts as required for mechanical and electrical service fixtures. Provide scribe moldings for closures at junctures of top, curb and splash with walls as recommended by manufacturer for materials involved. Use chemical resistant, permanently elastic sealing compound where recommended by manufacturer.
- D. Use acid resistant laminated plastic where practical. Kem Shield tops shall be provided at all counters adjacent to walls in all Science Classrooms, Labs and Material Storage. Kem Resin tops on all Student Research units and demonstration tables.

**3.03 INSTALLATION OF SINKS**

- A. Underside Installation: Use manufacturers' recommended adjustable support system for table-type and cabinet-type installations.
- B. Set top edge of sink unit firmly pressed to counter top, set in manufacturer's recommended chemical resistant sealing compound to produce a tight and fully leak-proof joint. Adjust sink and securely support to prevent movement.

**3.04 INSTALLATION OF ACCESSORIES**

- A. Install in a precise manner in accordance with manufacturer's directions. Turn screws to a flat seat; do not drive. Adjust moving parts to operate freely without excessive bind.
- B. Unless otherwise indicated all cabinets are to receive Division 9 full 4-inches high vinyl base, without the necessity to trim.

**3.05 CLEANING AND PROTECTION**

- A. Repair or remove and replace defective work as directed upon completion of installation.
- B. CLEAN SHOP-FINISHED SURFACES, touch-up as required, and remove or refinish damaged or soiled areas, approved by DP and PROJECT COORDINATOR.
- C. IN-TRANSIT STORAGE AND PROTECTION OF CASEWORK shall be protected. Store under cover in a ventilated building not exposed to extreme temperature and humidity



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changes. Do not store or install casework in building until concrete, masonry, and drywall/plaster work is dry.

- D. SITE CLEAN UP: Remove all cartons, debris, sawdust, scraps, etc., and leave spaces clean and all casework ready for PCSB use.

END OF SECTION



**DIVISION 12**

**SECTION 12500 — WINDOW TREATMENT**

**PART 1 – GENERAL**

**1.01 EXTENT OF SECTION**

- A. This section contains the requirements relating to interior window coverings such as blinds, shades, shutters, draperies, and curtains, including hardware and controls.
- B. The intent of the PCSB STANDARDS is for the DESIGN PROFESSIONAL (DP) to comply with the minimum general project requirements and the specific project specifications shall be generated and provided by the DP.

**1.02 SUBMITTALS**

- A. Submit in accordance with General, Supplementary and Special Conditions.
- B. Product data for each type of horizontal louver blind specified. Include printed data on physical characteristics.
- C. Shop drawings showing location and extent of blinds. Show installation details at and relationship to adjoining work. Include elevations indicating blind units. Indicate location of blind controls.
- D. Product Sample: submit one 16-inches x 24-inches long fully functional sample blind in color selected by PROJECT COORDINATOR.
- E. Schedule of horizontal louver blinds using same room designations indicated on drawings.
- F. Maintenance data for horizontal louver blinds to include in the operation and maintenance manual specified in Division 1. Include the following:
  - 1. Methods for maintaining horizontal louver blinds and finishes.
  - 2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance.

**1.03 QUALITY ASSURANCE**

- A. Single-Source Responsibility: Obtain each type of horizontal louver blind from one source and by a single manufacturer.

**1.04 FIELD CONDITIONS**

- A. FIELD MEASUREMENTS: Check actual horizontal louver blind dimensions by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- B. SPACE ENCLOSURE AND ENVIRONMENTAL LIMITATIONS: Do not install horizontal louver blinds until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity



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conditions shall be continuously maintained at values near those indicated for final occupancy.

**PART 2 – PRODUCTS**

**2.01 HORIZONTAL LOUVER BLINDS**

- A. Color to be selected from manufacturer's standard full range of colors.
- B. Manufacturer Subject to compliance with requirements, provide products by one of the following:
  - 1. Graber
  - 2. Hunter Douglas, Inc.
  - 3. Levolor Corp.
  - 4. Bali
- C. PRODUCT DESCRIPTION:
  - 1. **Steel Channel Head Rail:** "U"-shaped 1-inch by 1 ¼-inch deep channel, fabricated from 0.024-inch thick (before coating) phosphate treated steel with rolled edges at top with a prime coat of vinyl primer and finished coat of polyester baked enamel to match bottom rail and end support brackets and to coordinate with slats. Headrail shall be roll-formed after coating.
  - 2. **Head Channel Hardware:** Hardware shall be acetal low friction thermoplastic and guide lift cords and ladders in the head channel preventing wear and discoloration. Operating hardware shall be mechanically locked into head channel, by means of snap-in fittings with no mechanical cleats visible from underside of head rail.
  - 3. **Enclosed Metal Bottomrail:** Completely enclosed tubular shape, 0.024 –inch thick (before coating) phosphate treated steel with prime coat of vinyl primer and finished coat of polyester baked enamel matching head rail and coordinating with slate color. Bottom rail shall be roll-formed after coating with locking groove to receive dust cover. Thermoplastic protective caps in bottom of rail shall be used to secure ladder ends and assure windowsill protection. Hold-down bracket pins shall be available.
  - 4. **Slats:** Slats shall be aluminum alloyed for maximum strength, flexibility and resistance to corrosion. Slats shall be nominally 1-inch wide, actual .991-inch (plus .004-inch or minus .000-inch). Standard thickness is 0.006" optional, 0.008-inch is available. Slats shall have a pre-coating treatment to bond the polyester baked enamel finish coat that features out Advance Finishing Technology (AFT) which provides a smoother, harder, less porous surface that provides anti-static performance to help repel dust and anti-microbial qualifies to help resist fungal and bacterial growth.
  - 5. **Tilt Rod Support:** Tilt rod support shall be acetal low friction thermoplastic and shall support tilt rod. It shall provide a smooth bearing and center the ladder drum over ladder hold. Incorporated with tilt rod support shall be a grommet guide to guide lift cord and braided ladder through bottom of head rail. Acetal grommet shall have beveled edges to prevent cord and braided ladder wear and discoloration.
  - 6. **Ladder Drum:** Shall be injection molded thermoplastic with smooth hold edges to position ladder. Ladders shall be securely attached by means of a snap down top,



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- eliminating the need for braided ladder clips.
7. **Cord Lock:** Cord lock shall be of a snap-in design and incorporate a stainless steel wear guard over which cords pass and a floating shaft type locking pin. Locking pin shall be free of abrasive teeth and offer minimum wear to cord. Cord lock shall incorporate a “crash proof” safety feature that shall lock blind automatically upon release of cord. End of lift cords shall be treated with plastic tassels.
    - a. **Cord Guide:** Cord guide shall be nickel plated steel and shall guide and center lift cords into cord lock opening.
    - b. **Ring Pull:** When supplied with a standard nominal 4-inches cord length a single ring shall be attached to 2 and 4 cord blinds. Non-standard lengths of 8-inches or greater shall have a joiner ball located nominally 4-inches from the head rail and shall have two separate cords coming down from the joiner ball, each with a separate ring, to the specified non-standard length.
    - c. **Top-Locking Cord Lock:** An optional top-locking cord lock shall be available which provides for locking the blind in the fully raised position only with no intermediate locking positions other than fully lowered. The crash-proof feature is not available with a top-locking cord lock.
  8. **Shaft Type Tilter:** The tilter shall be of a worm and gear arrangement in a totally enclosed gear case (housing). The worm (tilter shaft) shall be a clear polycarbonate, the gear of nylon and the gear housing of acetalthermoplastic. The tilter shall be designed for smooth low friction operation and shall incorporate a clutch mechanism to eliminate damage due to over tilting. Tilter shall be a snap-in component allowing for field removal if required.
    - a. **Tilt Wand:** The tilt wand shall be a clear polycarbonate hollow rod, with a hexagonal shape measuring approximately ¼-inch across the points, providing a positive, comfortable grip. The wand shall hang vertically by its own weight and should be of sufficient length for easy access and operation. Wand shall be attached to the tilter shaft by means of a spring clip and shall be easily detached and reattached in the field.
    - b. **Tilt Limiter:** An optional single-range tilt limiter shall allow a select range of slat tilting operation including a fixed angle is so specified.
  9. **Cord Type Tilter:** The tilter shall be a direct drive system. The direct drive system shall utilize a hex tile rod ladder drum in place of the shaft type tilter with lit cord attached to the ladder drum by means of braided ladder clips. The tilt cords shall be equipped with plastic tassels. The tilter shall be designed for smooth operation and shall hold the slates at any angle.
  10. **Hexagonal Tilt Rod:** Tilt rod shall be electro-zinc coated solid steel. Tilt rod shall be hexagonal in cross-section measuring ¼-inch at its widest points. Tilt rod shall limit torsional deflection to 6 degrees in a 30-inch test length with a torque application of one-foot pound.
  11. **Braided Ladders (Slat Supports):** Bali Classics shall have braided ladder which shall assure proper control with adequate overlap of slats in the closed position. Distance between end latter and end of slats shall not exceed 6-inches; distance between braided ladders shall not exceed 23-inches.
    - a. **Braided Ladder Material:** Material shall be 100% high tenacity polyester yarn. Vertical component shall be not less than 0.045-inch diameter nor greater than





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0.066-inch diameter, and shall provide maximum strength and flexibility with minimum stretch. Horizontal component, or rungs, shall be not less than two threads and shall be approximately 31.0 mm long. Ladders shall be of sufficient length for bottom of blind to hang with a tolerance of plus one-half/minus zero inches of the specified length. Standard ladder shall provide 21.5 mm of distance between the slats. Optional 20mm and 22.5 mm spacing is available. Ladders shall be dyed to Bali color standard.

12. **Lift Cords:** Lift cords shall be braided with polyester jacket and center core or an approved equal construction. Size of cord shall be 1.44 mm. Cords shall be detachable, if required, and shall be of sufficient length to properly control the raising or lowering of the blind. Lift cords shall be equipped with plastic tassels, or optional ring pull with a 4-inch cord. Cord ends shall be securely anchored to the bottom rail and it shall be possible to detach and attach cords. Cording arrangements shall comply with assembly standards set for the size and weight of the blind. Cords shall be dyed to color standard.
13. **Cord Lock and Tilter Operation Locations:**
  - a. Bali Classics shall be made with the following cord lock and tilter location options when viewed from within the room;
    - 1) Tilter at left, cord lock at right (standard).
    - 2) Cord lock at left, tilter at right (reverse).
    - 3) Tilter and cord lock at left (both left).
    - 4) Tilter and cord lock at right (both right).
  - b. On blinds less than 13 7/8 inches wide, only options 1 and 2 above apply.
14. **End Support Brackets:** Standard hinged cover end support brackets of phosphate treated steel with prime coat of vinyl primer and finished coat of polyester baked enamel in color to match head rail. Brackets shall be marked left and right to facilitate installation and shall have 1¼-inch extra wide top to accommodate power screwdriver. Brackets shall facilitate easy removal of head channel. Optional head rail reveal brackets for recessed pocket installation shall be electroplated. Optional turn clip pivot brackets shall be provided for mounting head rail of blind within extruded aluminum blind pockets.
15. **Intermediate Support Brackets:** Brackets shall be furnished for blinds over 60-inches wide. Maximum spacing for intermediate support brackets shall be 48-inches.
16. **Extension Brackets:** Optional extension brackets are available.
17. **Hold-Down Brackets:** Optional universal hold-down brackets for sill or jamb installations are available.
18. **End Stiffeners:**
  - a. To add rigidity to the head rail, electroplated steel end stiffeners shall be inserted at each end of the head rail.
  - b. To eliminate lateral movement and to center the blind in the window, each end stiffener shall have a lateral adjustment tab.
19. **Accent Channels:** Optional side channels and bottom channels are available in any solid stat color, except Aluminum Texture and Brushed Aluminum.
20. **General:** The blind shall be free of sharp edges, burrs or other defects which might be harmful. When other materials result in improved specification, they may adopted.



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**21. Size Limitations:**

- a. **Standard Widths:** 12-43 ¾-inches (single blind on one head rail). Blinds up to 192 inches are available as two blinds on one head rail. Narrow blinds between 5½-inches and 11 available with engineering approval and normal limitations on performance and control locations.
  - b. **Maximum Drop:** For blinds 12-35-inches wide, the standard drop is 126-inches. For blinds wider than 35-inches, the standard drop is 150". Longer drops up to 240-inches available with engineering approval and normal performance limitations.
22. **Color:** Color of head rail, bottom rail, ladder, cord and plastic accessories shall coordinate with slats.
23. Each blind unit shall have UL label certifying that blind meets requirements of NPPA-701.

**2.02 FABRICATION**

- A. Prior to fabrication, verify actual opening dimensions by on-site measurement. Calculate blind dimensions to fit within specified tolerances.
- B. Fabricate blinds to fill openings from head to sill and jamb to jamb. The minimum clearance blind-to-blind shall be ¼-inch. Locate blind divisions at mullions.
- C. Fabricate blinds to fill all exterior window openings except at doors, door sidelights and transoms unless noted.
- D. Fabricate interior blinds to fit within H.M. frames and have bottom rail clips when on doors.

**PART 3 – EXECUTION**

**3.01 INSPECTION:**

- A. Verify that the work area in which the blinds shall be installed is free of conditions that interfere with blind installations and operations. Begin blind installation only when unsatisfactory conditions have been corrected.

**3.02. INSTALLATION**

- A. Install blinds in accordance with manufacturer's procedures except as otherwise specified herein.
- B. Install intermediate support brackets and extension brackets as needed to prevent deflection in head rail.
- C. Install blinds with adequate clearance to permits smooth operation of blinds and any sash operators. Hold blinds ¼-inch clear from each side of window opening on inside mount unless other clearance is indicated.
- D. Set tilt and lift controls. Demonstrate blinds to be in smooth, uniform working order.



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**3.03 CLEANING**

- A. Clean soiled blind surfaces with a mild soap solution. Do not use steam, hot water, bleach or any abrasive or solvent-based cleaners. Do not wash metallic colors.
- B. To ensure proper drying, provide adequate ventilation for blinds; remove bottom rail plastic end caps, and tip head rail and bottom rail to drain water.

**3.04 HORIZONTAL MINI BLIND SCHEDULE**

- A. Provide blinds at the following locations as shown on DP Design and Construction Documents.

END OF SECTION



## **PART 1 – GENERAL**

### **1.01 EXTENT OF SECTION**

- A. This section contains requirements for fixed seating located but not limited to auditoriums or where specified according to DP Design and Construction Documents.
- B. The intent of the PCSB STANDARDS is for the DESIGN PROFESSIONAL (DP) to comply with the minimum general project requirements and the specific project specifications shall be generated and provided by the DP.

### **1.02 QUALITY ASSURANCE**

- A. **COMPATIBILITY:** Provide each type of auditorium seating by a single manufacturer, including accessories, mounting, and installation components.
- B. **MOCK-UP:** Submit mock-up of section of seating, consisting of two chairs; include at least one aisle unit. Mock-up may be incorporated in construction after approval by the DP.
- C. **WARRANTY:** Provide a manufacturer's warranty covering the material and workmanship for a period of one year from date of final acceptance. Repair or replace any part which becomes defective during the warranty period, excepting where the product has been subject to accident, alterations, abuse, misuse or neglect.

### **1.03 SUBMITTALS**

- A. DP to specify:
  - 1. Fully upholstered chairs with automatic seat lift and standard manufacturer's seating colors.
- B. **PRODUCT DATA:** Submit manufacturer's technical data and installation instructions for auditorium seating.
- C. **SHOP DRAWINGS:** Submit shop drawings prepared from the DP Design and Construction Documents and from field measurements, including layout of seating units, chair sizes, aisle widths and seat numbering scheme.
- D. Samples for initial selection purposes in the form of manufacturer's color charts or samples of materials showing the full range of standard colors, finishes, patterns, and textures available for each exposed material, including:
  - 1. Upholstery Fabric,
  - 2. Plastic Laminate,
  - 3. Baked Enamel Finishes,
  - 4. Aluminum Finishes,
  - 5. Wood and Plywood Materials and Finishes,
  - 6. Molded Plastic,
  - 7. Numbers and Letter Plates.



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**SECTION 12600 — FIXED AUDIENCE SEATING**

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
  - 1. American Seating Co.
  - 2. Hussey Manufacturing Co., Inc.
  - 3. Irwin Seating Co.
- B. Base Specification: Irwin Seating Company Citation #4586.

**2.02 WOOD AND PLASTIC COMPONENTS**

- A. PARTICLEBOARD is not an acceptable material for writing surfaces or any part of the tablet arm, seating, or tables used by students.
- B. PLASTIC MOLDED SEAT AND BACK COVERS: No wood seats shall be acceptable.
- C. LOWER PART: One piece, sheet steel pan, reinforced at stress points and completely enclosing hinges and self-rising seat mechanisms.
- D. PLASTIC BACKS: One-piece, double walled, blow molded, high-density polyethylene in length sufficient to protect seat in up position.
  - 1. Reinforce back with steel at connections to steel mounting brackets.
- E. ARM RESTS: At each aisle and between chairs, designed for concealed mounting to standards.

**2.03 METAL COMPONENTS**

- A. STEEL PLATES, SHAPES, AND BARS: ASTM A 36.
- B. STEEL SHEETS FOR BAKED ENAMEL FINISH: ASTM A 591, commercial and drawing quality; Class C, galvanized-bonderized; 20 gage minimum unless otherwise indicated
- C. PADDING MATERIAL: Seat and back padding material shall be of new (prime manufacture) polyurethane foam. Padding material shall comply with the flammability requirements outlined in California Technical Information Bulletin #117, Resilient Cellular Materials, Section A & D, dated February 1975, when tested in accordance with Federal Test Method Standard 191, Method 5903.2.
- D. INJECTION MOLDED PLASTIC: Plastic shall be one-piece, high-impact, linear polyethylene with built-in, ultra-violet light inhibitors to retard fading. Plastic shall have a burn rate of 1inch per minute when tested in accordance with ASTM D635 or the Department of Transportation Motor Vehicle Safety
- E. PLASTIC LAMINATE: Plastic laminate shall be composed of a core of kraft papers, impregnated with phenolic resins, a decorative surface sheet, and overlay sheet containing



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melamine. Layers are fused together under pressures in excess of 1000 PSI, and shall meet or exceed performance standards as established by NEMA.

1. Thickness:
  - a. Horizontal Surfaces .050
  - b. Vertical Surfaces .030
- F. EXPANSION BOLTS: FS FF-B-588; Type, Class, and Style as recommended by chair manufacturer.
- G. WOOD SCREWS: Flat head carbon steel; FS FF-S-111; length as recommended by chair manufacturer.
- H. CONCEALED PLYWOOD: PS 1/ANSI A199.1.
- I. FABRIC: 100% nylon woven fabric complying with requirements of ASTM D 3597, including those for heavy-duty surface abrasion classification, and weighing not less than 20 ounces per linear yard. 100% Nouville Herculon or 100% Marquese-Lana may also be provided. Fabrics shall meet Class 1 flammability requirements of the U.S. Department of Commerce Commercial Standard 191-53 per Bulletin #117.

**2.04 FABRICATION**

- A. GENERAL: Fabricate auditorium seating units in contoured form for maximum comfort, using materials which are carefully selected shall be free of defects, objectionable projections, or irregularities; smoothly round corners, edges, and exposed fasteners, to present least possible snagging and pinching hazards.
- B. MOUNTING:
  1. **Floor Mounting:** Fabricate seating units for attachment to floor, using standards which have been manufactured to conform to slope of floor while maintaining seat and back in proper angular relationship.
- C. UPHOLSTERED CHAIRS:
  1. **General:** Fabricate auditorium seating with padding and fabric covering; equip seats with automatic uplift devices, so that unoccupied seats raise to uniform  $\frac{3}{4}$  fold and can be moved to perpendicular position by slight additional pressure for maximum passing room.
  2. **Seats:** The seat component shall be upholstered and padded on its top surface, with an injection molded plastic bottom shell, and shall automatically self-lift to three-quarter fold when unoccupied. Seat shall have provision to achieve a full-fold position when extra rearward pressure is exerted by the occupant to permit additional passage room while the occupant is standing. The seat shall be designed to provide exceptional comfort by a properly contoured foundation conforming to the human form in which supports the Ischial area with thicker padding, and the Popliteal area with softer padding, as well as placing these areas in comfort-generating relationships to each other.
  3. **Upholstery Pad:** The upholstery topper shall have a  $\frac{7}{16}$ -inch thick, 5-ply contour molded plywood foundation with molded polyurethane foam padding and fabric upholstery cover. The padding shall be thicker at the center for greater resiliency and thinner toward the edges where simple containment of the human form is required. A carefully tailored cover of the specified fabric shall be upholstered over the polyurethane foam pad and stapled to the bottom of the plywood panel.



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4. **Hinges:** Provide heavy-duty steel hinges of compensating type, each equipped with noiseless adjustable seat lifting device; provide for seat rotation on bushings which do not require lubrication, and positive internal stops cushioned with rubber or neoprene.
5. **Back Construction:** Backs shall be padded and upholstered, consisting of a one-piece injection molded plastic outer panel, and a  $\frac{7}{16}$ -inch, 5-ply hardwood inner upholstery panel. The outer panel shall be injection molded plastic, high impact-resistant with textured outer surface, formed to enclose the edges of the inner upholstery panel at the top and both sides of the back, and shall be not less than 26-inches in length, extending below the seat level to protect the seat cushion. There shall be no exposed screws above the armrests. Back wings for attaching the back to the standards shall be not less than 14 gauge (.0747") steel, secured to the inner panel by the use of four (4) machine screws threaded into four (4) threaded washers. The upholstery materials shall be placed over a 2-inches thick polyfoam pad. The polyfoam pad shall be securely cemented to the plywood inner panel and the upholstery fabric shall be securely fastened to the hardwood inner panel by means of upholstery staples to facilitate ease of re-upholstering. Back wings shall have provision for 16 degree, 20 degree or 24 degree pitch.
6. **Aisle Standards:** shall be pedestal design with 14 gauge (.0747") steel, 1-inch x 3-inches rectangular column. A formed panel of 16 gauge (.0598") steel shall be welded to the column to accept a decorator panel. The top of the column shall be provided with two formed steel dovetail lugs for secure attachment of the armrests. Brackets for seat attachment shall be of 11 gauge steel welded on inside of the standard. A tapered "decorator" aisle panel shall be density particle core, surfaced with plastic laminate of pattern selected.
7. **Center Standards:** shall be modern pedestal design fabricated of 14 gauge (.0747") steel to a 1-inch x 3-inches rectangular column. The top of the column shall be provided with two formed steel dovetail lugs for secure attachment of the armrests. A wing plate of 14 gauge (.0747") steel shall be welded to the column to provide for attachment of the back. Brackets for seat attachment shall be of heavy 7 gauge steel welded on each side of the standard. All weldments shall be gas shielded, arc weld.
8. **Floor Mounted Standards:** shall be provided with a formed 14 gauge (.0747) steel foot welded to the bottom of the rectangular column. This weldment shall be at all critical stress areas 360 degrees around the column, and concealed on the inside so as not to detract from clean appearance of the column. The foot dimension shall be 8-inches x  $2\frac{3}{4}$ -inches to provide maximum bearing surface to the floor. The standard shall be fabricated to be compatible with the floor incline, and to maintain proper seat and back height and angle.
9. **ADA Access Aisle Standards:** 1 percent of fixed seats shall be arranged for easy access by handicapped individuals and shall be designed to allow the individual to transfer easily from a wheelchair to the theatre chair. The aisle standard support column shall be inclined to the rear at the top by 16 degrees, and shall be equipped with an armrest capable of lifting to a position parallel with the chair back, opening sideways access to the seat. Decorative requirements of aisle standards are waived for the Handicapped Access Standards.
10. **Arm Rests:** Provide arm rest at each aisle and between chairs, designed for concealed mounting to standards, and as follows: Armrests shall be solid hardwood with plastic laminate on top surface. Armrests shall have two keyhole slots in the bottom to securely lock onto steel lugs at the top of the standard. Further, one security screw shall be utilized.

**D. ACCESSORIES:**

1. **Number and Letter Plates:** Provide anodized aluminum plates with black etched characters for seat location identification system corresponding to approved shop



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drawings. Fit number plates into vandal-resistant recess at front of seat and secure with two rivets. Attach matching row identification plate at rear of each aisle arm rest.

**E. FINISHES:**

1. **Iron and Steel:** Unless otherwise indicated, finish exposed iron and steel components with manufacturer's baked-on enamel, in color(s) as selected by the DP from manufacturer's standards.

**PART 3 - EXECUTION**

**3.01 INSPECTION**

- A. Installer must examine areas and conditions under which auditorium and theater seating is shall be installed, including condition of substrate to which seating standards are shall be attached, and must notify CONTRACTOR in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

**3.02 PREPARATION**

- A. **FIELD MEASUREMENTS:** Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments as necessary whenever taking field measurements prior to beginning fabrication might delay work.

**3.03 INSTALLATION**

- A. **GENERAL:** Comply with recommendations of seating manufacturer for secure and proper installation. Install chairs in locations indicated on approved shop drawings, with required clearances, elevations, and sight lines.
- B. **STANDARDS:** Install standards in locations necessitated by seating layout, with each standard attached to substrate by not less than 2 anchoring devices of recommended size.
- C. **CHAIRS:** Install chairs by mounting components to standards or brackets mounted on standards, using manufacturer's recommended hardware and fasteners. Insure that chairs in curved rows are installed at proper radius, and verify that moving components operate properly.

**3.04 ADJUST AND CLEAN**

- A. Adjust seat uplift mechanisms as required to assure that seats in each row are aligned when in upright position.
- B. Touch-up minor abrasions and imperfections in painted finishes with coating which matches factory-applied finish.
- C. Replace any upholstery which has been damaged in installation.
- D. Deliver stock of maintenance material to OWNER. Furnish the following maintenance material matching those installed and taken from same production run, packaged with protective covering for storage and identified with appropriate labels.





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**SECTION 12600 — FIXED AUDIENCE SEATING**

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1. Seat and Back Covers: Furnish sewn seat and back covers in quantity equal to 5 percent of chairs installed, with covers prorated to sizes of chairs used.

END OF SECTION



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**SECTION 12750 — TELESCOPIC BLEACHERS**

**PART 1 – GENERAL**

**1.01 EXTENT OF SECTION**

- A. Provide telescoping Gym Seating electrically operated systems of multiple-tiered seating rows comprising of seat, deck components, understructure that permits closing without requiring dismantling, into a nested configuration for storing or for moving purposes.
  - 1. **Typical Applications** include the following:
    - a. Wall Attached Telescoping Gym Seats;
    - b. Recessed Telescoping Gym Seats;
    - c. Floor-Attached (Freestanding) Telescoping Gym Seats;
    - d. Portable/Movable Telescoping Gym Seats.
    - e. Reverse Fold Telescoping Gym Seats.
  - 2. **Special Applications** include the following:
    - a. Tapered Section Telescoping Gym Seats;
    - b. Truncated Units Telescoping Gym Seats;
    - c. Rear Wall Column Cutouts Telescoping Gym Seats.
- B. The intent of the PCSB STANDARDS is for the DESIGN PROFESSIONAL (DP) to comply with the minimum general project requirements and the specific project specifications shall be generated and provided by the DP.

**1.02 OPERATION TYPES**

- A. MANUAL OPERATION
- B. TRACTIVE ELECTRIC OPERATION: Use units with non-marking rubber rollers or tracks that shall not mar or damage type of floor over which bleacher units' move. Control units by key-operated switch in wall-mounted control station.
- C. NON-TRACTIVE ELECTRIC OPERATION: Provide Manufacturer's Standard Non-tractive Powered Operation. Control units by key-operated switch in wall-mounted control.

**1.03 CODES AND STANDARD REFERENCES**

- A. To comply with requirements FBC, Section 301.1, latest edition, Existing Building and ICC 300-latest edition (*Bleachers, Folding and Telescopic Seating and Grandstands*).
- B. REFERENCES:
  - 1. National Fire Protection Association (NFPA)
  - 2. NFPA 102 Standard for Assembly Seating, Tents and Membrane Structures.
  - 3. American Welding society (AWS):
    - a. AWS D1.1 Structural Welding Code – Steel.
    - b. AWS D1.3 Structural Welding Code - Sheet Steel.
  - 4. American Institute of Steel Construction (AISC):
    - a. AISC - Design of Hot Rolled Steel Structural Members.



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5. American National Standards Institute (ANSI).
6. American Iron & Steel Institute (AISI):
  - a. AISI - Design Cold Formed Steel Structural Members.
7. Aluminum Association (AA):
  - a. AA - Aluminum Structures, Construction Manual Series.
8. American Society for Testing Materials (ASTM):
  - a. ASTM - Standard Specification for Properties of Materials.
9. National Forest of Products Association (NFoPA):
  - a. National Design Specification (NDS) for Wood Construction.
10. Southern Pine Inspection Bureau (SPIB):
  - a. SPIB - Standard Grading Rules for Southern Pine.
11. National Bureau of Standards/Products Standard (NBS/PS):
  - a. PS1 - Construction and Industrial Plywood.
12. Americans with Disability Act (ADA)
  - a. ADA - Standards for Accessible Design.

**PART 2 – PRODUCT**

**2.01 RECOMMENDED MANUFACTURER**

- A. Manufacturer: Hussey Seating Company, U.S.A.
  1. Address: North Berwick, Maine, 03906
  2. Telephone: (207) 676-2271; Fax: (207) 676-9690
  3. Product: Hussey Telescopic Gym Seat System
    - a. Model: MXM26 Series Telescopic Gym Seats, adjustable row spacing in two inch increments from 22 inches to 26 inches.
    - b. Aisle Type: foot level aisles, front steps.
    - c. Seat Type: MVP (plastic seat module).
      - (1) Seat color finish: manufacturer’s standard colors (minimum 15).
    - d. Rail Type: Self-storing rail, aisle hand rails.
    - e. Operation: electrical power
      - (1) Electrical Power System: Integral power with pendant control, motion monitor, and limit switches.
    - f. Dolly System: Portable Dolly.
  4. Product Description/Criteria:
    - a. Bank Length: \_\_\_\_\_
    - b. Aisle Widths: \_\_\_\_\_
    - c. Number of Tiers: \_\_\_\_\_
    - d. Row Spacing(s): \_\_\_\_\_
    - e. Row Rise: \_\_\_\_\_
    - f. Open Dimension: \_\_\_\_\_
    - g. Closed Dimension: \_\_\_\_\_
    - h. Overall Unit Height: \_\_\_\_\_
    - i. Net Capacity: \_\_\_\_\_ per seat  
 (18-inches for MAXAM, 19-22-inches for Sentinel Chairs.)



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**SECTION 12750 — TELESCOPIC BLEACHERS**

5. Miscellaneous Product Accessories: front panels, end panels, scorer's table, top seat filler, manual ball fenders, end curtains.
  6. Special Applications: high humidity finish, rear wall column cutouts (as required).
  7. Handicap Seating Provisions: Provide first tier handicap cutouts per requirements of (ADA) Americans with Disability Act located as indicated.
  8. Special Seating Graphics: Provide contrasting or matching seat top or seat base colors to create graphic pattern as indicated.
- B. Other Acceptable Manufacturers: Shall be considered if in compliance with these Standards. Deviations must be submitted with bid in order that a fair and proper evaluation shall be made. Those bidders not submitting a list of deviations shall be presumed to have bid as specified.

**2.02 MISC. MATERIALS**

- A. LUMBER: ANSI/Voluntary Product 20, B & B Southern Pine.
- B. PLYWOOD: ANSI/Voluntary Product PS1, APA A-C Exterior Grade.
- C. STRUCTURAL STEEL SHAPES, PLATES AND BARS: ASTM A 36.
- D. UNCOATED STEEL STRIP (Non-Structural Components): ASTM A569, Commercial Quality, Hot-Rolled Strip.
- E. UNCOATED STEEL STRIP (Structural Components): ASTM A570 Grade 33, 40, 45, or 50, Structural Quality, Hot-Rolled Strip.
- F. UNCOATED STEEL STRIP (Structural Components): ASTM A607 Grade 45 or 50, High-Strength, Low Alloy, Hot-Rolled Strip.
- G. GALVANIZED STEEL STRIP: ASTM A653 Grade 40, zinc coated by the hot-dip process, structural quality.
- H. STRUCTURAL TUBING: ASTM A500 Grade B, cold-formed.
- I. POLYETHYLENE PLASTIC: ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation; in color indicated or, if not otherwise indicated, as selected by DP from manufacturer's standard colors.
- J. Fasteners: Vibration-proof, of size and material standard with manufacturer.

**2.03 UNDERSTRUCTURE FABRICATION**

- A. FRAME SYSTEM:
  1. **Wheels:** Not less than 5-inches diameter by 1¼-inches with non-marring soft rubber face to protect wood and synthetic floor surfaces, with molded-in sintered iron oil impregnated bushings to fit ⅜-inch diameter axles secured with E-type snap rings.



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2. **Lower Track:** Continuous Positive Interglide System interlocks each adjacent CPI unit using an integral, continuous, anti-drift feature and through-bolted guide at front to prevent separation and misalignment. Each CPI unit shall contain a Low Profile Posi-Lock LX to lock each row in open position and allow unlocking automatically. Provide adjustable stops to allow field adjustment of row spacings.
3. **Slant Columns:** High tensile steel, tubular shape.
4. **Sway Bracing:** High tensile steel members through-bolted to columns.
5. **Upper Guide:** High tensile steel through-bolted to nose and riser; interlocks with adjacent upper tier to prevent separation and misalignment. Provide adjustable stops to allow field adjustment of row spacing.
6. **Deck Support:** Securely captures decking for entire length of section.

**B. DECK SYSTEM:**

1. **Section Lengths:** Each bank shall contain sections not to exceed 25-ft., 6-inches in length with a minimum of two supporting frames per row, each section.
2. **Nosing and Rear Riser:** Continuous roll formed galvanized steel members.
3. **Attachment:** Through-Bolted fore/aft to deck guides, and frame cantilevers.
4. Decking  $\frac{5}{8}$ -inch, AC grade, tongue & groove, transversely oriented plywood, interior type with exterior glue, 5-ply, all plies Southern Pine with plugged crossbands, produced in accordance with National Bureau of Standards PS-1-83. Longest unsupported span: MXM 26, 21 $\frac{1}{2}$ -inches; MXM 33, 28 $\frac{1}{2}$ -inches].
5. **Deck End Overhang:** Not to exceed frame support by more than 5-ft, 7-inches.

**2.04 SEATING FABRICATION**

**A. MVP SEAT SYSTEM:**

1. **Seat Modules:** 18-inches long unitized, interlocking, engineered, high density polyethylene modules providing scuff resistant textured 10-inches] wide anatomically contoured seat surface,  $\frac{1}{2}$ -inch minimum interlock on seat and face.
2. **Profile:** Designed with internal reinforcement ribs and cantilevered to the rear to provide not less than 3-inches smooth toe space beneath the seat.
3. **Seat Support:** Each seat support module shall be secured against fore/aft movement by not less than (2) two longitudinally sited steel fasteners spaced no less than 2 $\frac{1}{4}$ -inches on center, creating a steel to steel connection, tying the structure firmly to the steel nosing.
4. **Number Plates:** Seat module shall be designed to accept seat number plates.
5. **End Caps:** Each end of row shall be enclosed with matching end caps. End caps shall be designed with concealed attachment and provide indent for row letters. Color to match seat top.

**2.05 SHOP FINISHES**

- A. UNDERSTRUCTURE:** For rust resistance, steel understructure shall be finished on all surfaces with black "Dura-Coat" enamel. Understructure finish shall contain a silicone additive to improve scratch resistance of finish.



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- B. **WEAR SURFACES:** Surface subject to normal wear by spectators shall have a finish that does not wear to show different color underneath:
  - 1. Steel nosing and rear risers shall be pre-galvanized with a minimum spangle of G-60 zinc plating.
  - 2. Decking shall have surfaces to receive a sealer coat with use surfaces to receive high gloss clear urethane finish.
  - 3. Injection Molded shall be selected from fifteen (15) standard and seven (7) select colors. Colors shall be per manufacturer's standards
  
- C. **RAILINGS:** Steel railings shall be finished with powder coated semi – gloss black.

**2.06 FASTENINGS**

- A. **WELDS:** Performed by welders certified by AWS standards for the process employed.
  
- B. **STRUCTURAL CONNECTIONS:** Secured by structural bolts with prevailing torque lock nuts or Free-spinning nuts in combination with lock washers.

**2.07 ELECTRICAL OPERATION**

- A. **INTEGRAL POWER:** Furnish and install Hussey (PF 1, 2, 3, or 4), an integral automatic electro-mechanical propulsion system, to open and close telescopic seating. Integral Power and Control System shall be Underwriters Laboratories, Inc. (UL) approved and listed.
  
- B. Power operation shall utilize a combination of contactors and limit switches to insure the wiring is not energized except during operation. Straight wired electric system is not allowed.
  - 1. Operation shall be with a removable pendant control unit which plugs into seating bank for operator management of stop, start, forward, and reverse control of the power operation.
  - 2. Each Powered Frame unit shall consist of output shaft gear reducer with 6-inches diameter x 4-inches wide wheels covered with non-marring ½-inch thick composite rubber. Reducers shall be fitted with induction motors which shall provide an average operating speed of (46/25) f.p.m.
  - 3. **Operating Loads:** Each Powered Frame provides (220 / 550) lbs pull force which equals approximately (28 / 35) lbs psi lateral force on the floor.
  - 4. **Limit Switches:** Furnish and install both open and closed limit switches for the integral power system. The limit switches shall automatically stop integral power operation when seating has reached the fully extended or closed position.
  - 5. **Motion Monitor:** Provide flashing light with self-contained warning horn rated at 85 db at 10-ft. mounted under telescopic seating for audio and visual warning during integral power operation.
  - 6. **Electrical:** Seating Manufacturer shall provide all wiring within seating bank including pendant control.



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- a. Each unit is power operated by a 1/2 horsepower, 1725 R.P.M., 208 Volts, 50/60 Hz., three phase 1.25 service factor motor. This motor draws a full load current of 2.2 amperes. Power supply required shall be 120/208 volts three phase 4 wire plus ground service with 20 amps. Motors, housing, and wiring shall be installed and grounded in complete accord with the National Electric Code (NEC).
  - b. The electrical contractor shall provide required power source with no greater than 4 percent voltage drop at the seating's junction box. The electrical contractor shall perform all wiring connections in junction box that are attached to or a part of the building.
- C. PORTABLE POWER ASSIST: Furnish and install one portable electro-mechanical power unit to open/close telescopic seating sections equal to Hussey Pow-R-Trac IV complete with 100-ft. heavy duty electric cord and tractor receptacles (shall be fitted two per section). Portable power unit to operate from 120V 20 amp outlets located conveniently to bank(s) of seating. Tractor unit shall be fitted with rugged operating handle with convenient switches controlling forward/reverse separate from spring loaded on/off switch. Power drive unit shall consist of a dual output shaft gear reducer with 6-inches diameter wheels covered with non-marring 1/2-inch thick molded polyurethane. Reducers shall be fitted with induction motors which shall provide an average operating speed of 35 f.p.m.

**2.08 ACCESSORIES**

- A. FLEX-ROW: Provide first ROW modular units shall be utilized by persons in wheelchairs and able bodied persons. Each Flex-Row unit shall have an unlock lever for easy deployment if wheelchair access is needed. Unlock lever shall lock the bleacher seats into position when fully opened.
  1. Provide a black full surround skirting 1/2-inch off the floor for safety and improved aesthetics.
  2. Provide a black injection molded end cap for the nose beam for safety and improved aesthetics.
  3. Provide a mechanical positive lock when the Flex-Row system is in the open and used position.
  4. Flex-Row modular units are designed to achieve multi-use front row seating to accommodate team seating, ADA requirements and facility specific requirements. Flex-Row units are available in modular units from 2 - 7 seats wide as well as full section widths.
- B. Provide a removable belt barrier with or without signage for the rear of each recoverable Flex-Row module to assist with seating identification.
- C. FRONT AISLE STEPS: Provide at each vertical aisle location front aisle step. Front steps shall engage with front row to prevent accidental separation or movement. Steps shall be fitted with four non-skid rubber feet each 1/2-inch in diameter. Blow molded end caps shall have full radius on all four edges. Quantity and location as indicated.



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- D. **NON-SLIP TREAD:** Provide at front edge of each aisle locations an adhesive-backed abrasive non-slip tread surface.
- E. **FOOT LEVEL AISLES:** Provide deck level full width vertical aisles located as indicated.
- F. **INTERMEDIATE AISLE STEPS:** Intermediate aisle steps shall be of boxed fully enclosed type construction. Blow molded end caps shall have full radius on all four edges. Step shall have non-skid on surface. Quantity and location as indicated.
- G. **INTERMEDIATE AISLE HANDRAILS:** Provide single pedestal mount handrails 34-inches high with terminating mid rail. Handrails shall be attached to the socket and shall rotate 90 degrees for easy storage in socket. Aisle handrails that are detached from the socket for storage are unacceptable.
- H. **FRONT PANEL:** Provide elevated seating equipment with required full width front closure panels. Panels shall extend vertically from underside of front row to within 1½-inches of floor. Paneling shall be 5⁄8-inch Southern Pine Plywood or Polydeck attached to a steel framework.
- I. **END PANEL:** Provide closure end panels for stack position at each exposed bank ends. End panels shall be constructed of 5⁄8-inch Southern pine plywood or Polydeck.
- J. **REAR PANEL:** Provide required seating units with full width rear closure panels. Panels shall extend vertically full height or up to 8-ft. high to within 1 ½-inches of floor. Paneling shall be Southern Pine Plywood or Polydeck attached to a steel framework. Rear panels cannot extend above 8-ft. on portable sections.
- K. **FRONT RAIL:** Provide 38-inches high above deck, steel rails with tubular supports and intermediate members. Rails shall be located at each required seating locations.
- L. **SELF-STORING END RAILS:** Provide steel self-storing 42-inches high above seat, end rail with tubular supports and intermediate members designed with 4-inches sphere passage requirements.
- M. **SCORER'S TABLE:** Provide one 8-ft. by 15-inches scorer's table. Table top shall be grey high pressure laminate on 5⁄8-inch balance veneer core with cushioned edge mounting. Perimeter steel frame with tubular steel legs permanently attached to top with screws. Mounting sockets provided shall be attached to first row.
- N. **TOP SEAT FLUSH FILLER:** Provide at top seat level a flush filler board mounted between top seat and rear wall. Flush filler board shall be constructed of 1-inch nominal thickness Southern pine Grade "B & B" clear urethane finished.
- O. **MANUAL BALL FENDER:** Include on gym seat units six (6) rows or more of single stack configuration, top row foot well closure to prevent lodging of foreign objects.





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- P. **FULL SECTION RECOVERABLE TRUNCATION:** Provide a combination programming support and front rail as required to support full section recoverable truncation with remaining lower rows stored beneath. Support/front rail to extend 38-inches above deck and be designed to sustain live load of first seating row being programmed.
- Q. **EXTENDED REAR DECK FILLER:** Provide at rear deck level, an extended rear deck filler mounted between rear wall building columns. Select extended rear deck filler from twelve (12) standard sizes to meet site conditions.
- R. **REAR WALL COLUMN CUTOUTS:** Provide as required custom bleacher cutouts at rear wall building columns. Top row(s) shall be cutout, scribe, and fitted to meet wall column conditions.

**PART 3 – EXECUTION**

**3.01 INSPECTION**

- A. **VERIFICATION OF CONDITIONS:** Verify area to receive telescoping gym seats are free of impediments interfering with installation and condition of installation substrates are acceptable to receive telescoping gym seats in accordance with telescoping gym seats manufacturer's recommendations. Do not commence installation until conditions are satisfactory.

**3.02 INSTALLATION**

- A. **FIELD MEASUREMENTS:** Coordinate actual dimensions of construction affecting telescoping bleachers installation by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid delay of Work.
- B. **MANUFACTURER'S RECOMMENDATIONS:** Comply with telescoping gym seats manufacturer's recommendations for product installation requirements.
- C. **GENERAL:** Install telescoping gym seats in accordance with manufacturer's installation instructions and final shop drawings. Provide accessories, anchors, fasteners, inserts and other items for installation of telescoping gym seats and for permanent attachment to adjoining construction.

**3.03 ADJUSTMENT AND CLEANING**

- A. **ADJUSTMENT:** After installation completion, test and adjust each telescoping gym seats assembly to operate in compliance with manufacturer's operations manual.
- B. **CLEANING:** Clean installed telescoping gym seats on both exposed and semi-exposed surfaces. Touch-up finishes shall restore damage or soiled surfaces.

**3.04 PROTECTION & MAINTENANCE**



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- A. **GENERAL:** Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer to ensure telescoping gym seats are without damage or deterioration at time of substantial completion.
  
- B. **ATTIC STOCK:** 20 linear ft. and all related components required.

END OF SECTION