

SECTION 11490

GYMNASIUM EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following gymnasium equipment:
 - 1. Basketball equipment.
 - 2. Floor inserts.
 - 3. Divider curtain.
 - 4. Wall-mounted safety pads.
- B. Related Sections include the following:
 - 1. Division 3 Section "Cast-in-Place Concrete" for oversized recessed voids to be cast in concrete subfloors.
 - 2. Division 5 Section "Structural Steel" for structural supports not provided by gymnasium equipment manufacturer for supporting gymnasium equipment to building structure.
 - 3. Division 16 Sections for electrical service and connections for motor operators, controls, limit switches, and other powered devices and for system disconnect switches for motorized gymnasium equipment.
- C. Products furnished, but not installed under this Section, include floor insert sleeves for inserts to be cast in concrete subfloors.

1.03 DEFINITIONS

- A. NFHS: National Federation of State High School Associations.

1.04 SUBMITTALS

- A. General: Submit in accordance with Section 01300.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.
 - 1. Gymnasium Equipment Operators: Include operating instructions.
 - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- C. Shop Drawings: Show location and extent of fully assembled gymnasium equipment. Show location and extent of disassembled equipment and components and transport and storage accessories. Include elevations, sections, and details not shown in Product Data. Show method of field assembly, connections, installation details, mountings, floor inserts, attachments to other Work, operational clearances, and relationship to adjoining work.
 - 1. Blocking and Reinforcement: Show locations of blocking and reinforcement required for support of gymnasium equipment.
 - 2. Setting Drawings: For cast-in floor insert sleeves for post standards. Coordinate location of floor inserts with game lines and markers applied to finished flooring.
 - 3. Design Calculations: Calculate requirements for supporting gymnasium equipment. Verify capacity of members and connections to support loads and verify loads, point reactions, and locations for attachment of gymnasium equipment to structure with those indicated on Drawings.

4. Gymnasium Equipment Operators: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
 5. Wiring Diagrams: Power, signal, and control wiring.
- D. Samples: Submit color samples showing full range of options for the following products:
1. Wall protection mats.
 2. Divider curtains; for both open mesh and opaque fabric.
- E. Maintenance Data: For gymnasium equipment and gymnasium equipment operator to include in maintenance manuals.
- F. Warranty: Special warranty specified in this Section.
- 1.05 QUALITY ASSURANCE
- A. Source Limitations: Obtain gymnasium equipment through one source from a single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- 1.06 PROJECT CONDITIONS
- A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment. Verify dimensions by field measurements.
- 1.07 COORDINATION
- A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.
- B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction that is supported by overhead structure, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.
- 1.08 WARRANTY
- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Basketball backboard and backboard support failures including glass breakage.
 - b. Faulty operation of goal height adjuster.
 - c. Faulty operation of divider curtain.
 2. Warranty:
 - a. Basketball Backboard and Backboard Support: Lifetime warranty.
 - b. Goal Height Adjuster: Lifetime warranty.
 - c. Divider Curtain: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Porter Athletic Equipment Company; (603) 929-4384.

2.02 MATERIALS, GENERAL

- A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
 - 1. Extruded Bars, Profiles, and Tubes: **ASTM B 221 (ASTM B 221M)**.
 - 2. Flat Sheet: **ASTM B 209 (ASTM B 209M)**.
- B. Steel: Comply with the following:
 - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dip galvanized.
 - 2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53.
 - 3. Cold-Formed Steel Tubing: ASTM A 500, Grade A, unless another grade is required by structural loads.
 - 4. Steel Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513 or steel tubing fabricated from steel complying with ASTM A 569/A 569M and complying with the dimensional tolerances in ASTM A 500.
- C. Support Cable: **1/4-inch- (6-mm-)** diameter, 7x19 galvanized steel aircraft cable with a breaking strength of **7000 lb (3175 kg)**. Provide fittings complying with cable manufacturer's written recommendations for size, number, and method of installation.
- D. Castings and Hangers: Malleable iron, ASTM A 47/A 47M, grade required for structural loading.
- E. Softwood Plywood: DOC PS 1, exterior.
- F. Oriented Strand Board: DOC PS 2.
- G. Medium-Density Fiberboard: ANSI A208.2.
- H. Equipment Wall-Mounting Board: Wood, transparent or neutral color painted finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written recommendations.
- I. Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed tamperproof, vandal and theft resistant. Provide as required for gymnasium equipment assembly, mounting, and secure attachment.
- J. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 with minimum strength recommended in writing by gymnasium equipment manufacturer.

2.03 BASKETBALL EQUIPMENT

- A. General: Provide equipment complying with requirements in "NFHS Basketball Rule Book." Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.
- B. Overhead-Supported Backstop: Complete assembly spanning height indicated on Drawings, including primary and secondary superstructure support framing to building structure, pipe and cable bracing, adjustable hangers, clamps, cables, chains, pulleys, fittings, hardware, and fasteners.
 - 1. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
 - a. Center Mast: Welded construction with side sway bracing of pipe; saddle die-cut frame members with continuous full weld.
 - b. Cradle Superstructure: Backstop assembly shall be supported by superstructures designed by backstop manufacturer, including all bracing, bridging, structural support and

attachments. Cables will not be acceptable for diagonal bracing. Superstructure shall transfer the vertical and horizontal loads to the following locations.

- 1) Joist Girders: Superstructure hung from bottom chord of joist girders shall provide diagonal bracing extending from bottom chord attachment point to a superstructure framing member attachment spanning between top chords of joists, located tight against roof deck.
- 2) Superstructure members that impart lateral loads, (i.e., pulley and motor mounts), shall be designed to transfer all lateral loads to roof deck plane (top chord of joists or joist girders).
- c. Finish: Manufacturer's standard factory-applied primer for field finishing.
2. Forward-Folding Type: Provide manufacturer's standard assembly for the following types:
 - a. Rear Braced Units: Provide backstop with bracing to rear, complete with hardware and fittings to permit folding, in locations indicated.
 - 1) Product: Center-Strut Forward Fold, Rear Braced Backstop No. 917.
 3. Goal Height Adjuster: Adjustable, direct-mount goal attachment system, adjustable from **8 to 10 feet (2.4 to 3 m)** with crank mechanism, locking in any position within adjustment range, with visible height scale and finish matching framing. Provide at each cross-court backstop. Height adjustment units without direct-mount goal feature are not acceptable.
 - a. Operation: Manual with detachable crank handle.
 - b. Product: Center-Strut Height Adjustment System No. 00900-506.
- C. Backstop/Backboard Safety Device: Designed to limit free fall if support cable, pulleys, fittings, winch, or related components fail; with mechanical automatic reset; **6000-lb (2722-kg)** breaking strength and entire unit capable of withstanding 1,500-lb (680-kg) free fall load; one per folding backstop at cross courts.
 1. Retractor Device: Spring-activated, reel-type device designed to retract both support and safety cables, and straps away from play of the basketball when backstop is in playing position; one per folding backstop at cross courts.
 2. Product: "Saf-Strap" No. 10797-100.
- D. Electric Operator: Provide factory-assembled electric operator for backstop designed for lifting and lowering basketball equipment of type, size, weight, construction, use, and operation frequency indicated. Provide operation system, of size and capacity and with features, characteristics, and accessories suitable for Project conditions, recommended by gymnasium equipment manufacturer; complete with winch or hoist designed to move and hold backstop in any raised or lowered position, electric motor and factory-prewired motor controls with limit controls, remote-control stations, remote-control devices, power disconnect switch, enclosures protecting controls and all operating parts, and accessories required for proper operation. Include wiring from motor controls to motor. Coordinate operator wiring requirements and electrical characteristics with the building electrical system.
 1. Comply with NFPA 70.
 2. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6.
 3. Winch: Consisting of heavy-duty, fully enclosed worm gear reducer, belt and sprocket drive, cable drum, cable, and fittings. Provide one winch for each backstop.
 4. Electric Motor: UL-approved or -recognized, totally enclosed, insulated, capacitor-start motor, complying with NEMA MG 1, with thermal-overload protection, brake, and permanently lubricated bearings; sized to start and operate size and weight of basketball equipment considering Project's service conditions without exceeding nameplate ratings or considering service factor.
 - a. Service Factor: According to NEMA MG 1, unless otherwise indicated.
 - b. Motor Characteristics: Single phase, not less than 1/2 hp , 115 V, 60 Hz.
 5. Operator Mounting: Wall, on equipment mounting pad .
 6. Product: Electric Winch No. 00706-000.
- E. Key Pad Control Station: Flush wall mounted keypad control system, fitting in standard two-gang electrical box with a 12-volt control circuit to relay panels; each relay panel shall contain sixteen 30 amp relays for operating eight momentary type (up and down) 120 volt or low voltage pieces of equipment. Each relay panel shall include two maintained 30 amp relays for power control of designated equipment. Relays with a load rating of less than 30 amps shall not be considered equal. Keypad shall incorporate a four-digit programmable security code, easily reprogrammable, to prevent usage by unauthorized personnel; keypad shall automatically revert to secure mode if no button used within fifteen-second-time

period. System shall have tri-color LED at keypad for user feedback and additional LED's at keypad and relay panel circuit boards to ensure system is receiving power, is wired correctly and that relays are functioning properly. System shall be designed to operate all backboards and auxiliary gymnasium equipment. Standard key switch-type operation will not be considered equal.

1. Product: Powr-Touch Control No. 2500.

F. Basketball Backboard: Provide predrilled holes or preset inserts for mounting goals.

1. Description: Rectangular, **72 by 42 inches (1800 by 1050 mm)**, fabricated from the following:

a. Glass: Not less than **1/2-inch- (12-mm-)** thick, transparent tempered glass. Provide glass with impact-absorbing, resilient rubber or PVC gasket around perimeter in a fully welded painted steel frame, with steel subframe, reinforcement, and bracing, including center-strut frame reinforcement, and with mounting slots for mounting backboard frame to backstop support framing.

1) Direct Mount: Designed for mounting backboard frame to center mast of backstop framing to maximize relief of stresses on backboard frame and glass.

2) Rim-Restraining Device: Complying with NCAA and NFHS rules and designed to ensure that basket remains attached if glass backboard breaks.

b. Product: Rectangular Glass Backboard, No. 00208-000.

2. Target Area and Border Markings: Permanently etched in white color, marked in pattern and stripe width according to referenced rules.

G. Goal Mounting Assembly: Compatible with goal, backboard, and support framing, with manufacturer's standard hole pattern for goal attachment.

1. Glass Backboard Goal Mounting Assembly: Goal support framing and reinforcement designed to transmit load from goal to backboard frame and to minimize stresses on glass backboard.

H. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced "no-tie" loops welded around underside of ring.

1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication complying with referenced rules.

2. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism including positive-lock, preset pressure release, set to release at **250-lb (113-kg)** load, and automatic reset. Provide movable ring with rebound characteristics identical to those of fixed, nonmovable ring.

3. Mount: Front mount.

4. Net Attachment: No-tie loops for attaching net to rim without tying.

5. Finish: Manufacturer's standard factory-applied, baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness; orange.

6. Product: Power-Flex Goal, No. 00223-000.

I. Basketball Nets: 12-loop-mesh net, between **15 and 18 inches (400 to 450 mm)** long, sized to fit rim diameter, and as follows:

1. Competition Cord: Antiwhip, made from white nylon cord not less than 120 gm nor more than 144 gm thread.

J. Backboard Safety Pads: Provide safety pads, complying with NCAA and NFHS, designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports as required by referenced rules.

1. Safety Pad Attachment: Peel-and-stick tape.

2. Color: Manufacturer's standard color.

3. Product: Porter Padding Kit for Glass Backboards, No. 00227-000.

2.04 FLOOR INSERTS

A. Floor Insert: Chrome-finished steel floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, sized with ID to fit post standards, not less than **9 inches (230 mm)** long to securely anchor pipe sleeve as indicated on Drawings; with anchors designed for securing floor insert to floor substrate indicated; . Provide two sleeves.

1. Floor Plate: Lockable swivel access cover, designed for use with floating wood floors and to be flush with adjacent flooring. Provide two tools for unlocking access covers.
 - a. Product: Porter Floor Sleeve for Floating Wood Floors, No. 00872-100 with Sleeve Adapter No. 00879-000 for elevated floor installations. Verify accessories Owner is purchasing before ordering floor insert.

2.05 DIVIDER CURTAINS

- A. Divider Curtains: Electrically operated, roll up, and as follows:
 1. Upper Curtain, Mesh: Woven fabric of 100 percent polyester yarn coated with PVC weighing not less than **6.5 oz./sq. yd (220 g/sq. m)**, **45 to 50 percent open**.
 - a. Mesh Color: As selected by Architect from manufacturer's full range..
 2. Lower Curtain, Solid: Solid polyester coated with PVC, **20 oz./sq. yd (567 g/sq. m)**, **8-foot (2.4-m)** height above floor.
 - a. Fabric Color: As selected by Architect from manufacturer's full range for one color.
 3. Divider Curtain Flame-Resistance Ratings: Passes NFPA 701, inherently and permanently flame resistant.
 - a. Permanently attach label to each fabric of curtain assembly indicating whether fabric is inherently and permanently flame resistant or treated with flame-retardant chemicals, and whether it will require retreatment after designated time period or cleaning.
 4. Product: Roll-Up Gymnasium Divider Curtain No. 90675.
- B. Curtain Fabrication: Fused seams and the following:
 1. Top Hem: Reinforce with double thickness mesh for continuous pipe batten.
 2. Bottom Hems for Roll-up Curtains: Floor-length curtains with hems **2 inches (50 mm)** above finished floor and with manufacturer's standard **3-1/2- to 4-inch- (89- to 102-mm)** roll-up tube and lifting tape.
- C. Accessories:
 1. Curtain Battens: Fabricate battens from steel pipe with a minimum number of joints. As necessary for required lengths, connect pipe with drive-fit pipe sleeve not less than **18 inches (450 mm)** long, and secure with 4 flush rivets, plug welds, threaded couplings, or another equally secure method. Shop-paint completed pipe battens with black paint.
 - a. Steel Pipe: ASTM A 53/ A 53M, Grade A, standard weight (Schedule 40), black, **3-1/2-inch (89-mm)** nominal diameter, unless otherwise indicated.
- D. Divider Curtain Electric Operator: Provide operating machine of size and capacity recommended by manufacturer for equipment specified, with electric motor and factory-rewired motor controls, starter, gear-reduction unit, and remote controls. Coordinate wiring requirements and electrical characteristics with building electrical system.
 1. Operator Type: Electric motor, enclosed gear-head-reduction drive, with chain and sprocket secondary drive.
 2. Motor Characteristics: Sufficient to start, accelerate, reverse, and operate connected loads at designated speeds within installed environment and with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1, with thermal-overload protection and the following:
 3. Voltage: 120 V.
 4. Horsepower: 3/4 hp.
 5. Enclosure: Manufacturer's standard.
 6. Duty: Continuous duty at ambient temperature of **105 deg F (40 deg C)** and at altitude of **3300 feet (1005 m)** above sea level.
 7. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
 8. Phase: One.
 9. Key Pad Control Station: Wire divider curtain operator to keypad operator specified with basketball backstops.

2.06 WALL-MOUNTED SAFETY PADS

- A. Safety Pad Surface-Burning Characteristics: Provide safety pads with flame-spread index of 25 or less and smoke-developed index of 450 or less, as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Pad Covers: Provide safety pad fabric covers fabricated from puncture- and tear-resistant, not less than **14-oz. (397-g)** PVC-coated polyester or nylon-reinforced PVC fabric treated with fungicide for mildew resistance, with the fire-test-response characteristics indicated, lined with fire-retardant liner.
 - 1. Flame-Resistance Ratings: Passes NFPA 701.
- C. Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric cover, free from sag and wrinkles and firmly attached to back of backer board.
 - 1. Backer Board: Not less than **3/8-inch- (9.5-mm-)** thick plywood, mat-formed, or composite panel.
 - 2. Fire-Resistive Fill: Multiple-impact-resistant foam not less than **2-inch- (50-mm-)** thick fire-resistive neoprene, **6-lb (2.7-kg)** density.
 - 3. Size: Each panel section, **24 inches (600 mm)** wide by not less than **60 inches (1520 mm)** long .
 - a. Provide equal width pads for each leaf of door opening to Gym Equipment Room 104.
 - 4. Number of Panel Sections: As indicated on Drawings.
 - 5. Installation Method: Concealed mounting Z-clips.
 - a. Provide manufacturer's standard mounting method for removable pads on doors to Gym Equipment, Room 104.
 - 6. Fabric Cover Colors: As selected by Architect from manufacturer's full range for two colors.
 - 7. Product: Wall Pad No. 00345-3XX in size shown on Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.
 - 1. Verify critical dimensions.
 - 2. Examine supporting structure and below finished floor for subfloors.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly, where required.
- B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.
 - 1. Coordinate installation of overhead-supported backstops with painting schedule so backstop structure can be painted with overhead painting of Gymnasium.
- C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.
 - 1. Floor Insert Location: Coordinate location with application of game lines and markers.
 - 2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and type of floor plate.
 - 3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.

- D. Floor Insert Setting: Grout sleeve for post standards in oversized, recessed steel floor sleeves. Clean holes of debris. Position sleeve and fill void between sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions. Protect portion of insert sleeve above subfloor from splatter. Verify that insert sleeves are set plumb, aligned, and at correct height and spacing; hold in position during placement and finishing operations until grout is sufficiently cured. Set insert so top surface of completed unit is flush with finished flooring surface.
- E. Wall Safety Pads: Mount with bottom edge at dimension indicated on Drawings above finished floor.
- F. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.
- G. Connections: Connect automatic operators to building electrical system.

3.03 ADJUSTING

- A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.04 CLEANING AND PROTECTION

- A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure gymnasium equipment is without damage or deterioration at time of Substantial Completion.
- C. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment. Refer to Division 1 Section "Contract Closeout."

END OF SECTION