



SECTION 11 66 23
GYMNASIUM EQUIPMENT

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Ceiling mounted basketball backstops.
- B. Wall mounted basketball backstops.
- C. Portable basketball backstops.
- D. Gymnasium divider curtains.
- E. Multi-sport practice cages.
- F. Volleyball systems.
- G. Gymnasium wall padding.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete (03 30 00) - Cast-In-Place Concrete.
- B. Section 11 65 00 - Athletic and Recreational Equipment (11 65 00) - Athletic, Recreational, and Therapeutic Equipment.
- C. Section - (11 66 23) - Gymnasium Equipment

1.3 REFERENCES

- A. American Association of Textile Chemists and Colorists (AATCC):
 - 1. AATCC 30 - Antifungal Activity, Assessment on Textile Materials: Mildew and Rot

Resistance of Textile Materials.

- B. ASTM International (ASTM):
 - 1. ASTM D2261 - Standard Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine.
 - 2. ASTM D3574 - Standard Test Methods for Flexible Cellular Materials - Slab, Bonded, and Molded Urethane Foams.
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. California Fire Code Technical Information Bulletin (TIB):
 - 1. TIB 117 - Flammability Standard Requirements for Upholstered Furniture.
- D. Federal Motor Vehicle Safety Standards (FMVSS):
 - 1. FMVSS 302 - Flammability Test for Motor Vehicle Interiors.
- E. Federation Internationale de Volleyball (FIVB) - Rules and Regulations.
- F. National Fire Protection Association (NFPA):
 - 1. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
 - 2. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- G. International Standards Organization (ISO):
 - 1. ISO 20743 - Textiles - Determination of Antibacterial Activity of Textile Products.
- H. National Collegiate Athletic Association (NCAA) - Rules and Regulations.
- I. National Federation of State High School Associations (NFHS) - Rules and Regulations.
- J. Underwriters Laboratories (UL):
 - 1. UL 214 - UL Standard for Safety Tests for Flame-Propagation of Fabrics and Films.
 - 2. UL Standard 66010-2-201-Standard for Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.
- K. USA Volleyball (USAV) - Rules and Regulations.
- L. International Basketball Federation(FIBA) - Rules and Regulations.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data:
 - 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
- C. Shop Drawings: Submit manufacturer's shop drawings showing plans, elevations, sections, details and attachments to other work. Include equipment layouts, game markings and wiring diagrams as applicable.
 - 1. For basketball backstops attached to building structure, submit calculations for actual vertical and horizontal loads to be transmitted to structural roof framing supporting backstop assemblies. Loads shall be calculated for specific support configuration shown on Drawings.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
 - 1. All manufacturers must certify that no less than 90 percent of each product is produced with United States sourced material and labor.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- C. Source Limitations: All specified components including basketball backstops, gymnasium divider curtains, multi-sport practice cages, volleyball systems, and gymnasium wall padding shall be products of a single manufacturer.
- D. Equipment: Designed, fabricated, and installed to comply with requirements for competition play of the following associations:
 - 1. National Federation of State High School Associations (NFHS).
 - 2. National Collegiate Athletic Association (NCAA).
 - 3. International Basketball Federation (FIBA).
 - 4. USA Volleyball (USAV).
 - 5. Federation Internationale de Volleyball (FIVB).

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened packaging, with labels clearly identifying product name, manufacturer, and location of installation. Upon delivery, materials shall be inspected for damage. Deficient materials shall not be used.
- B. Storage: Store materials in a clean, dry area indoors in accordance with manufacturer's instructions. Keep temporary protective coverings in place to protect from damage due to moisture and construction activities.
- C. Handling: Protect materials and finish from damage to surface and edges during handling and installation.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard limited warranty for materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: IPI by bison, which is located at: 603 L St.; Lincoln, NE 68508; Toll Free Tel: 800-637-7968; Fax: 800-638-0698; Email: [request info](#)

(sales@ipibybison.com); Web:<http://ipibybison.com>

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements. All manufacturers must certify that no less than 90 percent of the product cost is produced with United States sourced material and labor.

2.2 CEILING-MOUNTED BASKETBALL BACKSTOPS

- A. Ceiling Mounted Basketball Backstops: As manufactured by IPI by Bison.
 - 1. Model: IP1345CW Ceiling Suspended, Wall Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Main Masts: Custom designed to suspend from structure.
 - b. Rear Braces: Extend to wall and attach to a horizontal wood stringer.
 - 2. Model: IP1345CS Ceiling Suspended, Ceiling Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Main Masts: Custom designed to suspend from structure.
 - b. Rear Brace Pipes: Incline to structure above.
 - 3. Model: IP1345BF Ceiling Suspended, Backward Fold, Rear Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Back Braces: Include a hinged joint.
 - b. Hinged Joint: Locks the backboard into playing position and is easily disengaged when the hoist cable pulls the hinge joint open. Systems which require springs to lock or unlock are not equal.
 - 4. Model: IP1345FRBF Ceiling Suspended Forward Roll, Backward Fold Basketball Backstops as manufactured by IPI by Bison.
 - a. Special Hangers: Enable main frame assembly to roll forward on track of 2 x 3 inches (51 x 76 mm) 11 gauge steel tubing so backstop folds in compact space.
 - b. Back Braces: Include a hinged joint.
 - c. Hinged Joint: Locks backboard into playing position and is easily disengaged when the hoist cable pulls the hinge joint open. Systems which require springs to lock or unlock are not equal.
 - 5. Model: IP1345SF Ceiling Suspended, Side Fold, Side Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Hinged Joints: Locks backboard into playing position and is easily disengaged when the hoist cable pulls the hinge joint open. Systems which require springs to lock or unlock are not equal.
 - 6. Model: IP1350FF Ceiling Suspended, Forward Fold, Rear Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Rear Braces: Includes a wedge lock assembly which rolls up and down the roller guide of 1-7/8 inch (48 mm) outer diameter, schedule 40 pipe.
 - b. Wedge Lock Assemblies: Adjustable to precisely plumb the face of backboard.
 - 7. Model: IP1360FF Ceiling Suspended, Forward Fold, Front Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Front Braces: Include a hinged joint.
 - b. Hinged Joint: Locks backboard into playing position and is easily disengaged when the hoist cable pulls the hinge joint open. Systems which require springs to lock or unlock are not equal.
 - 8. Model: IP1370FF Ceiling Suspended, Forward Fold, Front Braced Basketball Backstops as manufactured by IPI by Bison.
 - a. Main Masts: Mitered to suspend from structure above at a 30 degree angle.
 - b. Front Braces: Include a hinged joint.
 - c. Hinged Joint: Locks the backboard into the playing position and is easily disengaged when the hoist cable pulls the hinge joint open. Systems which require springs to lock or unlock are not equal.

9. Model: As scheduled and indicated on Drawings.
 10. Operation: Manual.
 11. Operation: Electric.
 12. Operation: As scheduled and indicated on Drawings.
 13. Main Frame Assemblies: Components form a rigid, triangle unit when assembled.
 - a. Main Central Masts: 6 inches (152 mm) outer diameter, 11 gauge steel tube.
 - b. Diagonal Sway Braces: 2-3/8 inches (60 mm) outer diameter schedule 40 pipe.
 - c. Horizontal Spreaders: 2 x 3 inches (51 x 76 mm), 11 gauge steel tube.
 - d. Adjustability: 1 inch (25 mm) diameter, 10 inches (254 mm) long threaded eyebolts to provide adjustability to level the frame during installation.
 14. Bearings: Bearing points operate on precision fit bronze oilless type bearings.
 15. Steel Support Structures: Backstops suspended from super structure.
 - a. Support Pipes: 3 inches (76 mm) schedule 40 steel pipe, 3-1/2 inches (89 mm) OD, for applications with building members spaced under 16 ft (4877 mm).
 - b. Support Pipes: 3 inches (76 mm) schedule 40 steel pipe, 3-1/2 inches (89 mm) OD, reinforced with 1-7/8 inches (48 mm) schedule 40 steel pipe and spacers welded to form bridging.
 - c. Support Pipes: Custom fabricated drop cradles for applications with sloped structure or excessive heights, as scheduled and indicated on Drawings.
 - d. Support Pipes: As scheduled and indicated on Drawings.
 16. Folding Braces: 2-3/8 inches (60 mm) outer diameter, schedule 40 pipe.
 17. Brace Fittings: Adjustable to precisely plumb the face of the backboard.
 18. Finishing: Factory applied polyester powder coating on metal parts, except galvanized or plated components.
 - a. Color: Black.
 - b. Color White.
 - c. Color: _____.
 - d. Color: As scheduled and indicated on Drawings.
 19. Finishing: Factory applied primer on metal parts, except galvanized or plated components, for field painting. Color: Gray.
- B. Electric Hoists: As manufactured by LynRus for IPI by Bison.
1. Model: BA973LR (3/4 HP) as manufactured by LynRus for IPI by Bison.
 2. Model: BA974LR (1 HP) as manufactured by LynRus for IPI by Bison.
 3. Model: As scheduled and indicated on Drawings.
 4. Hoist Type: Gear driven electric hoist designed to hold backstop at any position during raising or lowering.
 5. Motors: Standard, 115 Volt, single phase, UL Listed, instantly reversible with 20 minute duty cycle.
 6. Motors: _____.
 7. Motors: As scheduled and indicated on Drawings.
 8. Limit Switches: Rotary type switch controls, repeatable stop at raised and lowered positions.
 9. Gears: Hardened steel, positive locking, double reduction worm and worm wheel.
 10. Cable Take Up Drums: 4-1/2 inches (114 mm) outside diameter with cable take-up grooves. 60 ft (18288 mm) cable capacity.
 11. Lifting Capacity: 1250 lbs (567 kg) at 9 ft (2743 m) per minute.
 12. Cable: 1/4 inch (6 mm) diameter, galvanized, 6x19 strand core aircraft cable with 7,000 lbs (3175 kg) break strength.
 13. Gear Box: Fully enclosed; self-lubricating, ball bearing supported.
 14. Mounting: Clamps to 3-1/2 inches (89 mm) OD ceiling suspended structural pipe.
 15. Controls: Standard, 3 position key switch, momentary contact wall control switch to lower, raise, and stop backstop.
 - a. Keys: Two keys provided to Owner for each lock.
 - b. Cover Plates: Stainless steel, with up/down markings.
 16. Controls: Model IPGCPLUS Gym Command Plus Programmable Touch Screen

- Operating System for Gymnasiums as manufactured for IPI by Bison.
- a. Flush wall mounted 7 inch (178 mm) diagonal touch screen.
 - b. UL listed 12 x 16 x 4 inch (305 x 406 x 102 mm) steel relay boxes each capable of controlling up to 8 devices. Requires 120-volt, 30-amp single phase power source.
 - c. Use multiple relay boxes for operating additional devices.
 - d. Control system allows for operation of single or multiple groups of devices at the same time.
 - e. Easily programmable in the field.
 - f. Touch screens are password protected.
 - g. Allows installation of multiple touch screens.
17. Controls: Model IPGCS7 Gym Command 7 Control System as manufactured by IPI by Bison.
- a. Touch Screens: Wall mounted, 115 volt, UL Listed, 7 inches (178 mm), color, high resolution touch screen.
 - b. Control Panels: 115 volt hardwire from control panel to each device.
 - c. Operation: Factory programmed but field reprogrammable.
 - d. Device Capacity: 8.
 - e. Device Capacity: 16.
 - f. Device Capacity: 24.
 - g. Device Capacity: 32.
 - h. Device Capacity: As scheduled and indicated on Drawings.
18. Controls: Goal Tender II Wireless Remote Transmitter and Receiver Systems for Gymnasium Device Operation as manufactured by LynRus for IPI by Bison.
- a. Transmitters: Model IPGTS99LR as manufactured by IPI by Bison; handheld 9-volt battery, operated operates up to 99 separate devices.
 - b. Receivers: One IPGTS1LR required for each electric device.
19. Controls: As scheduled and indicated on Drawings.
- C. Manual Winches: As manufactured by LynRus by IPI by Bison.
1. Model: BA925LR as manufactured by LynRus for IPI by Bison.
 2. Type: Gear driven manual hoist designed to raise and lower backstops by means of a removable manually operated hand crank; compatible with electric manual driver.
 3. Gears: 40 to 1 gear ratio; hardened steel, positive locking, double reduction worm and worm wheel.
 4. Cable Take-Up Drum: 4 inches (102 mm) diameter aluminum drum with cable take up grooves and wide cable control flanges on each end.
 5. Lifting Capacity: 1000 lbs (454 kg).
 6. Cable: 1/4 inch (6 mm) diameter, galvanized, 6x19 strand core aircraft cable.
 7. Gear Case: Enclosed, self-maintaining thrust bearing supported.
 8. Mounting: Wall attachment behind backstop.
- D. Portable Electric Winch Winders: Reversible electric operator for manual winches.
1. Model: BA930 Winch Winder as manufactured for IPI by Bison.
 2. Motor: 120 Volt, 3/4 HP, high torque motor.
 3. Speed Control: 335 RPM low side or 750 RPM high side.
 4. Security: Lockable cord attachment to eliminate unauthorized use.
- E. Safety Locks: Model BA950LR as manufactured by LynRus for IPI by Bison.
1. Operation: Inertia sensitive mechanism automatically locks backstop in position at any time during storage, raising or lowering, due to a sudden surge of speed created by cable breakage or other failure, for each suspended unit.
 2. Single Failure Use: Equipment failure activates device; replacement required.
 3. Housing: Fully enclosed, cast aluminum.
 4. Safety Strips: 6000 lbs (2722 kg) capacity, 2 inches (51 mm) wide polyester strap; 35 ft (10668 mm) strap capacity.

5. Mounting: Mounts to 3-1/2 inches (89 mm) outside diameter ceiling suspended structural pipe with clamps provided by manufacturer.
- F. Goal Height Adjusters: As manufactured by IPI by Bison.
1. Model: BA980F, Manual, Fan Board as manufactured by IPI by Bison.
 2. Model: BA980RS Manual, 42 x 72 inches (1067 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 3. Model: BA980RT, Manual 48 x 72 inches (1219 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 4. Model: BA980RSE, Electric 42 x 72 inches (1067 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 5. Model: BA980RTE, Electric, 48 x 72 inches (1219 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 6. Adjustment Range: Goal position from 8 to 10 ft (2438 to 3048 mm) above court floor.
 7. Construction: Silver powder coated steel.
 8. Operation: 7/8 inch (22 mm) diameter Acme Lead screw with thrust bearing and hand crank for manual operation.
 9. Operation: 1/10 HP reversible linear actuator with built-in limit switches for electric operation.
 10. Operation: As scheduled and indicated on Drawings.
 11. Controls: Standard, 3 position key switch, momentary contact wall control switch to lower, raise, and stop backstop.
 - a. Keys: Two keys provided to Owner for each lock.
 - b. Cover Plates: Stainless steel, with up/down markings.
 12. Controls: Model IPGCPLUS Gym Command Plus Programmable Touch Screen Operating System for Gymnasiums as manufactured for IPI by Bison.
 - a. Flush wall mounted 7 inch (178 mm) diagonal touch screen.
 - b. UL listed 12 x 16 x 4 inch (305 x 406 x 102 mm) steel relay boxes each capable of controlling up to 8 devices. Requires 120-volt, 30-amp single phase power source.
 - c. Use multiple relay boxes for operating additional devices.
 - d. Control system allows for operation of single or multiple groups of devices at the same time.
 - e. Easily programmable in the field.
 - f. Touch screens are password protected.
 - g. Allows installation of multiple touch screens.
 13. Controls: Model IPGCS7 Gym Command 7 Control System as manufactured by IPI by Bison.
 - a. Touch Screens: Wall mounted, 115 volt, UL Listed, 7 inches (178 mm), color, high resolution touch screen.
 - b. Control Panels: 115 volt hardwire from control panel to each device.
 - c. Operation: Factory programmed but field reprogrammable.
 - d. Device Capacity: 8.
 - e. Device Capacity: 16.
 - f. Device Capacity: 24.
 - g. Device Capacity: 32.
 - h. Device Capacity: As scheduled and indicated on Drawings.
 14. Controls: Goal Tender II Wireless Remote Transmitter and Receiver Systems for Gymnasium Device Operation as manufactured by LynRus for IPI by Bison.
 - a. Transmitters: Model IPGTS99LR as manufactured by IPI by Bison; handheld 9-volt battery, operated operates up to 99 separate devices.
 - b. Receivers: One IPGTS1LR required for each electric device.
 15. Controls: As scheduled and indicated on Drawings.
- G. Backboards: As manufactured by IPI by Bison.
1. Model: BA42XL Unbreakable 42 x 72 inches (1067 x 1829 mm) Rectangular Glass

Backboard as manufactured by IPI by Bison.

- a. Backboards: 42 x 72 inches (1067 x 1829 mm) rectangular, 1/2 inch (13 mm) thick tempered glass.
 - b. Shooter's Square: Official white shooter's square and border with 5 x 4 inches (127 x 102 mm) goal mounting pattern.
 - c. Extruded Aluminum Frames: Held together in top corners by corner brackets that provide for the industry standard 36 x 62 inches (914 x 1575 mm) short board corner mounting pattern.
 - d. Support Structure: Factory fabricated rectangular tubular steel rim support structure extending the full 72 inch (1929 mm) width of the bottom of the backboard; mounted to aluminum framework in no less than 10 places.
 - e. Steel Spacers: Protrude through holes in glass so rim is isolated from glass.
 - f. Regulatory Requirements: Meets NCAA and NFHS standards.
 - g. Padding: Backboard predrilled to allow mounting of Model BA68U Backboard padding as manufactured by IPI by Bison.
2. Model: BA455 42 x 72 inches (1067 x 1829 mm) Rectangular Fiberglass Backboard as manufactured for IPI by Bison.
- a. Backboard: 42 x 72 inches (1067 x 1829 mm) rectangular fiberglass; accepts rims with a 5 x 4 inches (127 x 102 mm) hole pattern.
 - b. Shooter's Square: Official orange shooter's square and border are permanently molded into the playing surface; silk screened or vinyl adhesive applied border and shooter's square are not acceptable substitutions.
 - c. Front Shell: Gel coated fiberglass with minimum of 1/8 inch (3 mm) thickness.
 - d. Front and Rear: Permanently bonded together around a solid fiber core to create a solid backboard with an overall thickness of 1-1/2 inches (39 mm).
 - e. Steel Inserts: 16 threaded steel inserts are molded into the rear shell to facilitate mounting; permit mounting to all 36 x 62 inches (914 x 1575 mm) and 20 x 35 inches (508 x 889 mm) support structures.
 - f. Back of Backboard: Fiberglass.
3. Model: BA465 Fan-Shaped Fiberglass Front Mount Backboard as manufactured for IPI by Bison.
- a. Backboard: 54 x 39 inches (1372 x 991 mm) fan-shaped fiberglass designed for front mount rim applications; accepts rims with a 5 x 5 inches (127 x 127 mm) hole pattern.
 - b. Shooter's Square: Official orange shooter's square and border are permanently molded into the playing surface; silk screened or vinyl adhesive applied border and shooter's square are not acceptable substitutions.
 - c. Front Shell: Gel coated fiberglass, minimum of 1/8 inch (3 mm) thick and permanently bonded together around a solid fiber core to create a solid backboard with an overall thickness of 1-1/2 inches (39 mm).
 - d. Steel Inserts: 8 threaded steel inserts are molded into the rear shell to facilitate mounting to common 20 x 35 inches (508 x 889 mm) support structures.
 - e. Back of Backboard: Fiberglass.
4. Model: BA495 Fan-Shaped Steel Front Mount Backboard as manufactured by IPI by Bison.
- a. Backboard: 54 x 39 inches (1372 x 991 mm) fan-shaped formed and welded steel designed for front mount rim applications; accepts rims with a 5 x 5 inches (127 x 127 mm) hole pattern.
 - b. Finishing: White polyester powder coat.
 - c. Shooter's Square: Official orange shooter's square and border.
 - d. Skin: 12 gauge mild steel.
 - e. Support Structure: 7 gauge and 10 gauge mild steel.
 - f. Skin Edges: Formed to create a 1-1/2 inches (39 mm) lip to add strength.
5. Model: As scheduled and indicated on Drawings.

H. Goals: As manufactured by IPI by Bison.

1. Model: BA3180S 180 degrees Breakaway Goal as manufactured by IPI by Bison.
 - a. Design: Goal designed and constructed so that when downward pressure exceeding the release pressure setting is applied at any location within 90 degrees either to the left or to the right of the point on the ring farthest from the backboard, the entire ring assembly will pivot downward.
 - b. Field Adjustability: Release pressure setting is field adjustable and designed with a detent style positive lock mechanism so that the ring cannot be released until the setting pressure is exceeded.
 - c. Ring: Constructed of 5/8 inch (16 mm) diameter carbon steel.
 - d. Tubular Segments: Spaced and welded a full 360 degrees around the lower surface of the 5/8 inch (16 mm) ring to allow the goal net to be securely attached without fasteners by means of a single nylon coated cable.
 - e. Heat Treatment: Steel components that come in contact with other steel components during release of the ring assembly shall be heat treated to a minimum depth of 0.020 inch (0.5 mm), hardness of 50 on Rockwell C scale.
 - f. Release Mechanism: Isolated from player contact and pinch point risk by means of a steel cover plate.
 - g. Hole Pattern BA3180S shall have a 5 x 4 inches (127 x 102 mm) hole pattern.
 - h. Regulatory Requirements: Meets NCAA, FIBA and NFHS standards.
 - i. Nets: Anti-whip white nylon.
 - j. Hardware: Zinc plated grade 5 mounting hardware, 2 net attachment cords.
 - k. Finishing: Goal has an orange powder coated finish.
2. Model: BA35S Competition Breakaway Goal as manufactured by IPI by Bison.
 - a. Ring: 5/8 inch (16 mm) diameter steel ring with continuous wire netlocks.
 - b. Backplate Components: Constructed of 3/16 inch (5 mm) thick steel.
 - c. Mounting Plate: Punched with hole patterns for mounting to any competition front mount fan or rectangular backboard.
 - d. Rim Support Brace: 1/4 x 1-1/2 inches (6 x 39 mm) steel and provide continuous support for 180 degrees of the circumference of the 5/8 inch (16 mm) ring.
 - e. Breakaway Mechanism: Positive lock design, factory preset; an automatic return is provided by means of two return springs which also cushion the breakaway action when the pressure release setting has been exceeded; two hardened steel balls shall be contained in a tubular assembly with each being forced outward with equal pressure by a single spring. The balls nest on each side of the rim/backplate assembly in a hardened detent. Said ball/detent mechanism provides proper breakaway pressure. Zero pinch points.
 - f. Regulatory Requirements: Meets NCAA and NFHS standards.
 - g. Nets: Anti-whip white nylon.
 - h. Hardware: Zinc plated grade 5 mounting hardware, 2 net attachment cords.
 - i. Finishing: Rim has an orange powder coated finish.
3. Model: BA35 Competition Breakaway Goal as manufactured by IPI by Bison.
 - a. Ring: 5/8 inch (16 mm) diameter steel ring with continuous wire netlocks.
 - b. Backplate Components: Constructed of 3/16 inch (5 mm) thick steel.
 - c. Mounting Plate: Punched with hole patterns for mounting to any competition front mount fan or rectangular backboard.
 - d. Rim Support Brace: 1/4 x 1-1/2 inches (6 x 39 mm) steel and provide continuous support for 180 degrees of the circumference of the 5/8 inch (16 mm) ring.
 - e. Breakaway Mechanism: Positive lock design, factory preset; an automatic return is provided by means of two return springs which also cushion the breakaway action when the pressure release setting has been exceeded; two hardened steel balls shall be contained in a tubular assembly with each being forced outward with equal pressure by a single spring. The balls nest on each side of the rim/backplate assembly in a hardened detent. Said ball/detent mechanism provides proper breakaway pressure. Zero pinch points.

- f. Regulatory Requirements: Meets NCAA and NFHS standards.
- g. Nets: Anti-whip white nylon.
- h. Hardware: Zinc plated grade 5 mounting hardware, 2 net attachment cords.
- i. Finishing: Rim has an orange powder coated finish.
- 4. Model: Model BA27 Standard Front Mount Goal as manufactured by IPI by Bison.
 - a. Ring: Official size high carbon 5/8 inch (16 mm) diameter ring with continuous wire formed netlocks.
 - b. Backplate: Minimum 3/16 inch (5 mm) thick.
 - c. Ring Support: 1/2 inch (13 mm) diameter steel brace.
 - d. Net: White nylon.
 - e. Finishing: Rim has an orange powder coated finish.
- 5. Model: Model BA27A Front Mount Super Goal as manufactured by IPI by Bison.
 - a. Rim: Official size 5/8 inch (16 mm) diameter carbon steel ring welded to a 1/4 inch (6 mm) thick backplate punched to fit all front mount backboards; with continuous wire formed netlocks.
 - b. Ring Support: 5/8 inch (16 mm) diameter ring.
 - c. Bottom Side of Joint Between Backplate and Ring: An additional 6 inches (152 mm) long, 5/8 inch (16 mm) diameter formed bar must be welded full length on both sides.
 - d. Mounting Hardware: Provided by manufacturer.
 - e. Net: White nylon.
 - f. Finishing: Goal shall have an orange powder coated finish.
- 6. Model: As scheduled and indicated on Drawings.
- I. Backboard Padding: Bolt-on backboard padding for bottom edge and corners of backboard to provide safety protection to meet NCAA and NFHS requirements as manufactured for IPI by Bison.
 - 1. Model: BA68U padding.
 - 2. Construction: Cellular construction with skin integral to the cushion using a self-skinning molding process, 0.060 inch (1.5 mm) average skin thickness; a steel track molded into the padding shall provide rigidity and strength to the mounting system.
 - 3. Tear Strength: Minimum 125 psi (862 kPa).
 - 4. Hardware: Provided by manufacturer.
 - 5. Vinyl Cover Color: As selected from manufacturer's standard colors.
 - 6. Vinyl Cover Color: As indicated on the Drawings.

2.3 WALL MOUNTED BASKETBALL BACKSTOPS

- A. Wall Mounted Stationary Backstops: As manufactured by IPI by Bison.
 - 1. Model: IP10WB Wall Mounted Stationary Backstop
 - 2. Wall to Backboard Face Extension: 12 to 120 inches (305 to 3048 mm).
 - 3. Upper and Lower Backboard Extensions: 1-1/2 inch (38 mm) O.D. schedule 40 steel pipe of length required to place the face of the backboard the desired distance from wall. Steel plates shall be welded to both ends of the extensions for attachment to both the backboard and the wood wall board attachments.
 - 4. Diagonal Bracing: 1/4 by 1-1/4 inch (6 by 31 mm) steel flat connected to extension pipes with formed steel fittings.
 - 5. Wood Wall Attachment Boards: 2 x 8 inch (51 by 203 mm) Southern Yellow Pine with clear finish.
 - 6. Upper Diagonal Supports: 3/16 inch (4.8 mm) coil proof chain with 3/8 inch (9.5 mm) turnbuckle for adjustments.
 - 7. Wall Anchors: Provided by installer to suit specific wall structure requirements.
- B. Wall Mounted Side Fold Backstops: As manufactured by IPI by Bison.
 - 1. Model: IP15WSF Wall Mounted Side-Fold Backstop
 - 2. Wall to Backboard Face Extension: 48 to 120 inches (1219 to 3048 mm).

3. Upper and Lower Backboard Extensions: 1-1/2 inch (38 mm) O.D. schedule 40 steel pipe of length required to place the face of the backboard the desired distance from wall. Formed steel fittings provided at each to permit folding. All pivot points shall operate on precision bronze oil less type bearings.
 4. Diagonal Bracing: 1-1/4 by 1-1/4 inch (31 by 31 mm) steel bars, connected to pipe frame with formed steel fittings.
 5. Wood Wall Attachment Boards: 2 x 8 inch (51 by 203 mm) Southern Yellow Pine with clear finish.
 6. Upper Extension Frame: Supported by 3/8 inch (9.5 mm) coil proof chain and turnbuckles.
 7. Wall Anchors: Provided by installer to suit specific wall structure requirements.
- C. Wall Mounted Fold-Up Backstops: As manufactured by IPI by Bison.
1. Model: IP12WF Wall Mounted Fold-Up Backstop.
 2. Wall to Backboard Face Extension: 48 to 120 inches (1219 to 3048 mm).
 3. Upper and Lower Backboard Extensions: 1-1/2 inch (38 mm) O.D. schedule 40 steel pipe of length required to place the face of the backboard the desired distance from wall. The extension pipes shall be spaced as required for backboard specified, cross braced with 3/8 inch (9.5 mm) dia. rods and welded into one assembly to minimize vibration. Formed steel fittings, provided at each end of the extension frames, shall permit folding as well as attaching extension frames to both the backboard and the wood wall attachment boards.
 4. Wood Wall Attachment Boards: 2 x 8 inch (51 by 203 mm) Southern Yellow Pine with clear finish.
 5. Upper Extension Frame: Supported by 3/8 inch (9.5 mm) coil proof chain and turnbuckles.
 6. Wall Anchors: Provided by installer to suit specific wall structure requirements.
 7. Manual Winches: As manufactured by LynRus for IPI by Bison.
 - a. Model: BA925LR as manufactured by LynRus for IPI by Bison.
 - b. Type: Gear driven manual hoist designed to raise and lower backstops by means of a removable manually operated hand crank; compatible with electric manual driver.
 - c. Gears: 40 to 1 gear ratio; hardened steel, positive locking, double reduction worm and worm wheel.
 - d. Cable Take-Up Drum: 4 inches (102 mm) diameter aluminum drum with cable take up grooves and wide cable control flanges on each end.
 - e. Lifting Capacity: 1000 lbs (454 kg).
 - f. Cable: 1/4 inch (6 mm) diameter, galvanized, 6x19 strand core aircraft cable.
 - g. Gear Case: Enclosed, self-maintaining thrust bearing supported.
 - h. Mounting: Wall attachment behind backstop.
 8. Portable Electric Winch Winders: Reversible electric operator for manual winches.
 - a. Model: BA930 Winch Winder as manufactured for IPI by Bison.
 - b. Motor: 120 Volt, 3/4 HP, high torque motor.
 - c. Speed Control: 335 RPM low side or 750 RPM high side.
 - d. Security: Lockable cord attachment to eliminate unauthorized use.
 9. Electric Winches: As manufactured by LynRus for IPI by Bison.
 - a. Hoist Type: Gear driven electric hoist designed to hold backstop at any position during raising or lowering model manufactured for IPI by LynRus.
 - b. Limit Switch: Rotary type switch controls repeatable stop at raised and lowered positions.
 - c. Gears: Hardened steel, positive locking, double reduction worm and worm wheel.
 - d. Cable Take Up Drum: 4-1/2 inches (114 mm) outside diameter with cable take-up grooves. 60' cable capacity.
 - e. Lifting Capacity: 1250 lbs at 9 feet per minute.
 - f. Cable: 1/4 inch (6 mm) diameter, galvanized, 6x19 strand core aircraft cable.

- g. Gear Box: Fully enclosed. Self-lubricating, ball bearing supported.
 - h. Mounting: Clamps to 3-1/2 inch (89 mm) OD ceiling suspended structural pipe.
 - i. Model: BA973LR (3/4 HP) as manufactured by LynRus for IPI by Bison.
 - j. Model: BA974LR (1 HP) as manufactured by LynRus for IPI by Bison.
 - k. Motors: Standard, 115 Volt, single phase, UL Listed, instantly reversible with 20 minute duty cycle.
 - l. Motors: As indicated on the Drawings.
10. Controls: Standard, 3 position key switch, momentary contact wall control switch to lower, raise, and stop backstop as manufactured for IPI by Bison.
- a. Keys: Two keys provided to Owner for each lock.
 - b. Cover Plates: Stainless steel, with up/down markings.
11. Controls: Model IPGCPLUS Gym Command Plus Programmable Touch Screen Operating System for Gymnasiums as manufactured for IPI by Bison.
- a. Flush wall mounted 7 inch (178 mm) diagonal touch screen.
 - b. UL listed 12 x 16 x 4 inch (305 x 406 x 102 mm) steel relay boxes each capable of controlling up to 8 devices. Requires 120-volt, 30-amp single phase power source.
 - c. Use multiple relay boxes for operating additional devices.
 - d. Control system allows for operation of single or multiple groups of devices at the same time.
 - e. Easily programmable in the field.
 - f. Touch screens are password protected.
 - g. Allows installation of multiple touch screens.
12. Controls: Model IPGCS7 Gym Command 7 Control System as manufactured by IPI by Bison.
- a. Touch Screens: Wall mounted, 115 volt, UL Listed, 7 inches (178 mm), color, high resolution touch screen.
 - b. Control Panels: 115 volt hardwire from control panel to each device.
 - c. Operation: Factory programmed but field reprogrammable.
 - d. Device Capacity: 8.
 - e. Device Capacity: 16.
 - f. Device Capacity: 24.
 - g. Device Capacity: 32.
 - h. Device Capacity: As scheduled and indicated on Drawings.
13. Controls: Goal Tender II Wireless Remote Transmitter and Receiver Systems for Gymnasium Device Operation as manufactured by LynRus for IPI by Bison.
- a. Transmitters: Model IPGTS99LR as manufactured by IPI by Bison; handheld 9-volt battery, operated operates up to 99 separate devices.
 - b. Receivers: One IPGTS1LR required for each electric device.
14. Controls: As scheduled and indicated on Drawings.
- D. Safety Locks: Model BA950LR as manufactured by LynRus for IPI by Bison.
- 1. Operation: Inertia sensitive mechanism automatically locks backstop in position at any time during storage, raising or lowering, due to a sudden surge of speed created by cable breakage or other failure, for each suspended unit.
 - 2. Single Failure Use: Equipment failure activates device; replacement required.
 - 3. Housing: Fully enclosed, cast aluminum.
 - 4. Safety Strips: 6000 lbs (2722 kg) capacity, 2 inches (51 mm) wide polyester strap; 35 ft (10668 mm) strap capacity.
 - 5. Mounting: Mounts to 3-1/2 inches (89 mm) outside diameter ceiling suspended structural pipe with clamps provided by manufacturer.
- E. Goal Height Adjusters: As manufactured by IPI by Bison.
- 1. Model: BA980F, Manual, Fan Board as manufactured by IPI by Bison.
 - 2. Model: BA980RS Manual, 42 x 72 inches (1067 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.

3. Model: BA980RT, Manual 48 x 72 inches (1219 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 4. Model: BA980RSE, Electric 42 x 72 inches (1067 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 5. Model: BA980RTE, Electric, 48 x 72 inches (1219 x 1829 mm) Rectangular Board as manufactured by IPI by Bison.
 6. Adjustment Range: Goal position from 8 to 10 ft (2438 to 3048 mm) above court floor.
 7. Construction: Silver powder coated steel.
 8. Operation: 7/8 inch (22 mm) diameter Acme Lead screw with thrust bearing and hand crank for manual operation.
 9. Operation: 1/10 HP reversible linear actuator with built-in limit switches for electric operation.
 10. Operation: As scheduled and indicated on Drawings.
- F. Backboards: As manufactured by IPI by Bison.
1. Model: BA42XL Unbreakable 42 x 72 inches (1067 x 1829 mm) Rectangular Glass Backboard as manufactured by IPI by Bison.
 - a. Backboards: 42 x 72 inches (1067 x 1829 mm) rectangular, 1/2 inch (13 mm) thick tempered glass.
 - b. Shooter's Square: Official white shooter's square and border with 5 x 4 inches (127 x 102 mm) goal mounting pattern.
 - c. Extruded Aluminum Frames: Held together in top corners by corner brackets that provide for the industry standard 36 x 62 inches (914 x 1575 mm) short board corner mounting pattern.
 - d. Support Structure: Factory fabricated rectangular tubular steel rim support structure extending the full 72 inch (1929 mm) width of the bottom of the backboard; mounted to aluminum framework in no less than 10 places.
 - e. Steel Spacers: Protrude through holes in glass so rim is isolated from glass.
 - f. Regulatory Requirements: Meets NCAA and NFHS standards.
 - g. Padding: Backboard predrilled to allow mounting of Model BA68U Backboard padding as manufactured by IPI by Bison.
 2. Model: BA455 42 x 72 inches (1067 x 1829 mm) Rectangular Fiberglass Backboard as manufactured for IPI by Bison.
 - a. Backboard: 42 x 72 inches (1067 x 1829 mm) rectangular fiberglass; accepts rims with a 5 x 4 inches (127 x 102 mm) hole pattern.
 - b. Shooter's Square: Official orange shooter's square and border are permanently molded into the playing surface; silk screened or vinyl adhesive applied border and shooter's square are not acceptable substitutions.
 - c. Front Shell: Gel coated fiberglass with minimum of 1/8 inch (3 mm) thickness.
 - d. Front and Rear: Permanently bonded together around a solid fiber core to create a solid backboard with an overall thickness of 1-1/2 inches (39 mm).
 - e. Steel Inserts: 16 threaded steel inserts are molded into the rear shell to facilitate mounting; permit mounting to all 36 x 62 inches (914 x 1575 mm) and 20 x 35 inches (508 x 889 mm) support structures.
 - f. Back of Backboard: Fiberglass.
 3. Model: BA465 Fan-Shaped Fiberglass Front Mount Backboard as manufactured for IPI by Bison.
 - a. Backboard: 54 x 39 inches (1372 x 991 mm) fan-shaped fiberglass designed for front mount rim applications; accepts rims with a 5 x 5 inches (127 x 127 mm) hole pattern.
 - b. Shooter's Square: Official orange shooter's square and border are permanently molded into the playing surface; silk screened or vinyl adhesive applied border and shooter's square are not acceptable substitutions.
 - c. Front Shell: Gel coated fiberglass, minimum of 1/8 inch (3 mm) thick and permanently bonded together around a solid fiber core to create a solid backboard with an overall thickness of 1-1/2 inches (39 mm).

- d. Steel Inserts: 8 threaded steel inserts are molded into the rear shell to facilitate mounting to common 20 x 35 inches (508 x 889 mm) support structures.
 - e. Back of Backboard: Fiberglass.
4. Model: BA495 Fan-Shaped Steel Front Mount Backboard as manufactured by IPI by Bison.
- a. Backboard: 54 x 39 inches (1372 x 991 mm) fan-shaped formed and welded steel designed for front mount rim applications; accepts rims with a 5 x 5 inches (127 x 127 mm) hole pattern.
 - b. Finishing: White polyester powder coat.
 - c. Shooter's Square: Official orange shooter's square and border.
 - d. Skin: 12 gauge mild steel.
 - e. Support Structure: 7 gauge and 10 gauge mild steel.
 - f. Skin Edges: Formed to create a 1-1/2 inches (39 mm) lip to add strength.
5. Model: As scheduled and indicated on Drawings.
- G. Goals: As manufactured by IPI by Bison.
1. Model: BA3180S 180 degrees Breakaway Goal as manufactured by IPI by Bison.
- a. Design: Goal designed and constructed so that when downward pressure exceeding the release pressure setting is applied at any location within 90 degrees either to the left or to the right of the point on the ring farthest from the backboard, the entire ring assembly will pivot downward.
 - b. Field Adjustability: Release pressure setting is field adjustable and designed with a detent style positive lock mechanism so that the ring cannot be released until the setting pressure is exceeded.
 - c. Ring: Constructed of 5/8 inch (16 mm) diameter carbon steel.
 - d. Tubular Segments: Spaced and welded a full 360 degrees around the lower surface of the 5/8 inch (16 mm) ring to allow the goal net to be securely attached without fasteners by means of a single nylon coated cable.
 - e. Heat Treatment: Steel components that come in contact with other steel components during release of the ring assembly shall be heat treated to a minimum depth of 0.020 inch (0.5 mm), hardness of 50 on Rockwell C scale.
 - f. Release Mechanism: Isolated from player contact and pinch point risk by means of a steel cover plate.
 - g. Hole Pattern nylon shall have a 5 x 4 inches (127 x 102 mm) hole pattern.
 - h. Regulatory Requirements: Meets NCAA, FIBA and NFHS standards.
 - i. Nets: Anti-whip white nylon.
 - j. Hardware: Zinc plated grade 5 mounting hardware, 2 net attachment cords.
 - k. Finishing: Goal has an orange powder coated finish.
2. Model: BA35S Competition Breakaway Goal as manufactured by IPI by Bison.
- a. Ring: 5/8 inch (16 mm) diameter steel ring with continuous wire netlocks.
 - b. Backplate Components: Constructed of 3/16 inch (5 mm) thick steel.
 - c. Mounting Plate: Punched with hole patterns for mounting to any competition front mount fan or rectangular backboard.
 - d. Rim Support Brace: 1/4 x 1-1/2 inches (6 x 39 mm) steel and provide continuous support for 180 degrees of the circumference of the 5/8 inch (16 mm) ring.
 - e. Breakaway Mechanism: Positive lock design, factory preset; an automatic return is provided by means of two return springs which also cushion the breakaway action when the pressure release setting has been exceeded; two hardened steel balls shall be contained in a tubular assembly with each being forced outward with equal pressure by a single spring. The balls nest on each side of the rim/backplate assembly in a hardened detent. Said ball/detent mechanism provides proper breakaway pressure. Zero pinch points.
 - f. Regulatory Requirements: Meets NCAA and NFHS standards.
 - g. Nets: Anti-whip white nylon.
 - h. Hardware: Zinc plated grade 5 mounting hardware, 2 net attachment cords.

- i. Finishing: Rim has an orange powder coated finish.
 - 3. Model: BA35 Competition Breakaway Goal as manufactured by IPI by Bison.
 - a. Ring: 5/8 inch (16 mm) diameter steel ring with continuous wire netlocks.
 - b. Backplate Components: Constructed of 3/16 inch (5 mm) thick steel.
 - c. Mounting Plate: Punched with hole patterns for mounting to any competition front mount fan or rectangular backboard.
 - d. Rim Support Brace: 1/4 x 1-1/2 inches (6 x 39 mm) steel and provide continuous support for 180 degrees of the circumference of the 5/8 inch (16 mm) ring.
 - e. Breakaway Mechanism: Positive lock design, factory preset; an automatic return is provided by means of two return springs which also cushion the breakaway action when the pressure release setting has been exceeded; two hardened steel balls shall be contained in a tubular assembly with each being forced outward with equal pressure by a single spring. The balls nest on each side of the rim/backplate assembly in a hardened detent. Said ball/detent mechanism provides proper breakaway pressure. Zero pinch points.
 - f. Regulatory Requirements: Meets NCAA and NFHS standards.
 - g. Nets: Anti-whip white nylon.
 - h. Hardware: Zinc plated grade 5 mounting hardware, 2 net attachment cords.
 - i. Finishing: Rim has an orange powder coated finish.
 - 4. Model: Model BA27 Standard Front Mount Goal as manufactured by IPI by Bison.
 - a. Ring: Official size high carbon 5/8 inch (16 mm) diameter ring with continuous wire formed netlocks.
 - b. Backplate: Minimum 3/16 inch (5 mm) thick.
 - c. Ring Support: 1/2 inch (13 mm) diameter steel brace.
 - d. Net: White nylon.
 - e. Finishing: Rim has an orange powder coated finish.
 - 5. Model: Model BA27A Front Mount Super Goal as manufactured by IPI by Bison.
 - a. Rim: Official size 5/8 inch (16 mm) diameter carbon steel ring welded to a 1/4 inch (6 mm) thick backplate punched to fit all front mount backboards; with continuous wire formed netlocks.
 - b. Ring Support: 5/8 inch (16 mm) diameter ring.
 - c. Bottom Side of Joint Between Backplate and Ring: An additional 6 inches (152 mm) long, 5/8 inch (16 mm) diameter formed bar must be welded full length on both sides.
 - d. Mounting Hardware: Provided by manufacturer.
 - e. Net: White nylon.
 - f. Finishing: Goal shall have an orange powder coated finish.
 - 6. Model: As scheduled and indicated on Drawings.
- H. Backboard Padding: Bolt-on backboard padding for bottom edge and corners of backboard to provide safety protection to meet NCAA and NFHS requirements as manufactured for IPI by Bison.
 - 1. Model: Model BA68U padding as manufactured by IPI by Bison.
 - 2. Construction: Cellular construction with skin integral to the cushion using a self-skinning molding process, 0.060 inch (1.5 mm) average skin thickness; a steel track molded into the padding shall provide rigidity and strength to the mounting system.
 - 3. Tear Strength: Minimum 125 psi (862 kPa).
 - 4. Hardware: Provided by manufacturer.
 - 5. Color: As selected from manufacturer's standard colors.
 - 6. Color: As indicated on the Drawings.

2.4 PORTABLE BASKETBALL BACKSTOPS

- A. Model: BA898G T-Rex 96 Portable Basketball System as manufactured by IPI by Bison. Entire system is to meet rules for high school and collegiate play.

1. Performance Requirement: Approved for FIBA LEVEL 2 competition.
 2. Backboard: Competition size 42 x 72 inch (1067 x 1829 mm) tempered glass, 1/2 inch (12.7 mm) thick. Official white border and shooters square.
 - a. Frame: Extruded Aluminum.
 - b. Face: 6 inch (152 mm) minimum from front of padded base when rim is at 10 ft (3048 mm).
 - c. Basket Rim: Mounts through backboard glass into horizontal extension arm to reduce stress on glass during play.
 - d. Breakaway Rim: Designed to flex with equal pressure in any direction around the front 180 degree circumference of the ring. Tubular net attachment system.
 - e. Backboard Padding: Bolt-on molded urethane with steel inserts molded into padding. Color: As determined by Architect from manufacturer's choice of 16 school colors.
 3. Structural Steel Components:
 - a. Tubing: Minimum of 4 x 4 inch (102 x 102 mm) and 4 x 2 inch (102 x 51 mm) tubing with minimum 1/4 inch (6 mm) wall thickness.
 - b. Horizontal Extension Arm: Reinforced by minimum two 1/4 inch (6 mm) thick steel members for no less than 7 ft (2134 mm) of the arm length.
 - c. Pivot Points: 1-1/4 inch (32 mm) steel pivot pins in self-lubricating bearings.
 - d. Finish: White textured polyester powder coated.
 4. Base: Welded Frame. A fully enclosed ballast compartment, factory loaded with steel ballast.
 - a. Urethane Casters: Six, 8 inch (203 mm) diameter, 2 inch (51 mm) wide.
 - 1) Front: Two single casters.
 - 2) Rear: Two double casters.
 5. Padded Base Dimensions (WxL): Approximately 40 x 74 inch (1016 x 1880 mm).
 6. Independent Tensioning Device: Between the uprights provide additional rigidity to entire structure.
 7. Operation:
 - a. Backboard and Goal Suspension: Raises and lowers goal for play and storage. A pivoting, welded steel structure utilizing extension springs to counter balance weight of backboard and goal.
 - b. Front locator pins, floor locator bushings, and rear hold-downs.
 - c. Goal is raised and lowered by one person and locked at desired rim height or storage position by means of a telescoping height adjustment mechanism that has permanent rim height markings.
 - 1) Rim Heights: 7 to 10 ft in 6 inch (2134 to 3200 mm) increments.
 8. When rolled into playing position, front of system shall be lifted from the front wheels onto two 4 inch (102 mm) diameter urethane stabilizer pads.
 - a. Stabilizer Pads: shall be lowered by means of a threaded lead screw located at the top front corners of the base.
 9. Entire front and sides of the base and front of the structural upright shall be padded a minimum of 2 inch (51 mm) thick in choice of 17 school colors.
 10. Lower surface of horizontal extension arm shall be padded to a distance of 60 inches (1524 mm) from the rear of the backboard.
 11. Overall Dimensions in Storage Position: (WxLxH): 76 x 160 x 78 inch (1930 x 4064 x 1981 mm).
 12. System Weight: Approximately 2,350 lbs (1066 kg).
 13. Warranties:
 - a. Backboard: Limited lifetime.
 - b. Structure: 10-year limited.
 - c. Padding: 10-year replacement.
 - d. Breakaway Goal: 5-year.
- B. Model: BA8910IG T-Rex International, 10 ft 8 inches (3251 mm) Basketball System as manufactured by IPI by Bison. Entire system meets all rules for high school and collegiate

and FIBA play.

1. Performance Requirement: Approved for FIBA LEVEL 1 competition.
2. System Weight: 3100 lbs (1406 kg) .
3. Base Size (WxL): 44 x 72 inches (1118 x 1829 mm).
4. Total Stored Dimension (WxLxH): Approximately 76 x 208 x 83 inch (1930 x 5283 x 2108 mm). Component Warranties:
 - a. Backboard: Limited lifetime.
 - b. Structure: 20-year limited.
 - c. Unit Padding: 1-year.
 - d. Backboard Padding: 10-year.
 - e. Breakaway Goal: 3-year.
5. Finish: Powder-coated in white. All exposed metal surfaces to be powder coated or zinc-plated.
6. Welded Frame:
 - a. Base: 5 x 2 x 1/8 inch (127 x 51 x 3 mm) steel tubing welded to form a rectangle for supporting two steel yokes.
 - b. Yokes: Welded assembly. Two, 3 x 4 x 3/16 inch (76 x 102 x 5 mm) steel tubes with 3 x 3 x 3/16 inch (76 x 76 x 5 mm) steel tube cross members, and 3 x 4 x 3/16 inch (76 x 102 x 5 mm) steel tube gussets.
 - 1) Hinge Fittings: On upper and lower yoke frame. Steel Pivot Pins: 1-1/4 inch (32 mm) diameter riding on polyurethane friction bushings.
 - c. Main Beam: 6 x 6 x 3/16 inch (152 x 152 x 5 mm) steel tubing reinforced along top with a tubular steel spine for added stability.
 - d. Ballast Compartment: Fully-enclosed. Supported by the welded base. Factory loaded with steel ballast.
 - e. Front of Frame: Fitted with a positioning pin at both sides, guaranteeing correct positioning during play.
 - f. Backboard to Impact Area Clearance: 10 ft 8 inches (3251 mm).
 - g. Sight Lines: To maximize sightlines for spectators,
 - 1) Main Vertical Frame Members: Front and rear, including padding, to be 11 inches (279 mm) sloping to a height of 40 inches (1016 mm).
 - 2) Horizontal Frame: 39 inch (991 mm) maximum above floor level.
7. Wheels: Entire system rests on the floor when in the storage position on ten, 8 inch (203 mm) diameter by 2 inch (51 mm) wide non-marking urethane casters, two double-swivel front casters, and three double-rear fixed casters.
 - a. Maximum Load for Each Wheel: 2000 lbs (90.7 kg).
8. Anchors: System requires a floor insert, brass cover plate, and adjustable length turnbuckle to anchor the unit per NCAA specifications.
 - a. For Wood Floors: Brass cover plate is not be connected to the anchor in the concrete, in order to allow movement of the wood floor.
9. Folding Cycle: Unit operates on a spring balance system constructed of 7-5/8 inch (194 mm) diameter steel springs with steel section 5/8 inch (16 mm) diameter.
 - a. Tension on Springs: Adjustable.
 - b. Telescopic Rod: Outer Rod: 2-1/8 inch (54 mm). Inner Rod: 1-3/4 inch (44 mm), lock unit into position with a spring-activated positive locking pin at 10 ft (3048 mm).
 - c. A manual pin is to be used to lock goal further, and alternate height settings may be added by the customer.
 - d. Turnbuckle Tensioner Device: Provides stability between the vertical yokes.
 - e. Automatic Base Control System: Unit is lifted off floor, during collapsing stage using the motion of the two yokes that support the main beam, by means of 2 vertical push rods connected to struts and a sub-frame inside the main frame.
 - f. Push Rods: Mounted to front yoke. Connected to struts which thread into a stable sub-frame bar.
 - g. As the goal is placed in playing position, the push rods engage the struts downward which places the stabilizing system bar firmly on the floor surface.

- Height is adjustable by a floating adjustable nut at the base of the vertical rod.
- 1) Manual version available in cases of limited space.
 - 2) Screw down mechanisms shall not be considered equal.
10. Padding:
 - a. Front Padding: 4 inch (102 mm) thick foam covered with reinforced leather grain vinyl. 6 inch (152 mm) thick in area where players collide with the unit.
 - b. Side Pads: 3 inch (76 mm) thick. Fit the main beam, directly behind the backboard, with a pad to protect players' heads.
 - c. Padding Color: As determined by the Architect.
 - d. Padding Color: _____.
 11. Goal and Backboard Attachment: Via a true direct mount system, completely eliminating stress on heat tempered glass backboard during play.
 - a. True direct mount: Rim bolts directly to front metal plate on backboard, and the rear metal plate of the backboard bolts directly to the welded plate on the main backboard support beam of the backstop.
 - b. No glass between the front and back steel mounting plates of the backboard. Glass plate shall have a cut-out area around the mounting plates of the backboard, which are supported by a tubular steel lower frame and polished aluminum frame on its full perimeter.
 - c. Backboards with Glass Between Metal Mounting Plates: Not considered equal.
 12. Breakaway Rim: Designed to flex with equal pressure in any direction around the front 180 degree circumference of the ring, and have tubular net attachment system.
 - a. Detente Mechanism: Prevents breakaway until approximately 180 lbs (81.6 kg) of force is applied.

2.5 GYMNASIUM DIVIDER CURTAINS

- A. Gymnasium Divider Curtains: Model IP850 Fold-Up Gymnasium Divider Curtains as manufactured by IPI by Bison.
 1. Fire Resistance:
 - a. UL 214 and NFPA 701: Rated as self-extinguishing.
 - b. California State Fire Marshall: Registered as approved.
 2. Opening Height, Width: As scheduled and indicated on Drawings.
 3. Design: Folding action; stored curtain not reliant on single cable for support.
 4. Hoist Lines: 1/8 inch (3 mm) diameter steel aircraft cables, attached to steel tube batten in bottom hem of curtain, run through grommets vertically spaced 18 inches (457 mm) on center to top of curtain and terminating at individual drums formed on drive pipe shafts above curtains.
 5. Hoist Line Spacing: Not exceeding 120 inches (3048 mm) on center.
 6. Drive Pipe Shafts: 2-3/8 inches (60 mm) diameter.
 7. Bottom Tube Battens: 1-5/8 inches (41 mm) diameter tubes.
 8. Top Tube Battens: 1-5/8 inches (41 mm) diameter galvanized steel tubes, suspended from each drive pipe support assembly with adjustable 2/0 chain.
 9. Electrical Operation of Drive Shaft:
 - a. Power Unit: Compensating type, 115 Volt, single phase, reversible motor with built-in thermal overload protection.
 - b. Speed Reduction: Through load holding worm and worm gears.
 - c. Remote Control Operation: Includes integral limit switch to control upper and lower limit of curtain travel.
 - d. Horsepower: 3/4.
 - e. Horsepower: 1.
 - f. Horsepower: As scheduled and indicated on Drawings.
 10. Lower Curtains:
 - a. Lower Curtain Height: Standard, 96 inches (2438 mm).
 - b. Lower Curtain Height: As scheduled and indicated on Drawings.
 - c. Materials: Flame retardant polyester reinforced solid VCN fabric with anti-

- d. bacterial and fungi-resistant treatment.
 - d. Seams and Outer Edge Hems: Electronically welded, 1 inch (25 mm) full contact weld.
 - e. Bottom Pockets: 2/0 coil proof chain enclosed inside pocket.
 - f. Vinyl Fabric: 18 ounces per square yard.
 - g. Vinyl Fabric: 22 ounces per square yard.
 - h. Vinyl Fabric: As scheduled and indicated on Drawings.
 - i. Vinyl Color: As selected from manufacturer's standard colors.
 - j. Vinyl Color: As indicated on the Drawings.
11. Upper Curtains:
- a. Materials: VCP mesh, with woven vinyl encapsulated polyester yarns, 50 percent plus open grid weave.
 - b. Hoist Line Location Reinforcement: Solid vinyl fabric strips, 6 inches (154 mm) wide, welded to the VCP mesh.
 - c. Top Pocket: Solid vinyl fabric welded to top edge of VCP mesh to form pocket hem that accommodates tube batten for curtain support.
 - d. Curtain Color: As selected from manufacturer's standard colors.
 - e. Curtain Color: As scheduled and indicated on Drawings.
- B. Gymnasium Divider Curtains: Model IP870 Top-Roll Gymnasium Divider Curtains as manufactured by IPI by Bison.
1. Fire Resistance:
 - a. UL 214 and NFPA 701: Rated as self-extinguishing.
 - b. California State Fire Marshall: Registered as approved.
 2. Opening Height, Width: As scheduled and indicated on Drawings.
 3. Electrical Operation of Drive Shaft:
 - a. Power Unit: 115 Volt, single phase motor, built-in thermal overload protection.
 - b. Speed Reduction: Through a load holding worm gear.
 - c. Horsepower: 3/4.
 - d. Horsepower: 1.
 - e. Horsepower: As scheduled and indicated on Drawings.
 - f. Integral Limit Switch: Controls the upper and lower limit of curtain travel.
 4. Lower Curtains:
 - a. Lower Curtain Height: Standard, 96 inches (2438 mm).
 - b. Lower Curtain Height: As scheduled and indicated on Drawings.
 - c. Materials: Flame retardant polyester reinforced solid VCN fabric with anti-bacterial and fungi-resistant treatment.
 - d. Seams and Outer Edge Hems: Electronically welded, 1 inch (25 mm) full contact weld.
 - e. Vinyl Fabric: 18 ounces per square yard.
 - f. Vinyl Fabric: 22 ounces per square yard.
 - g. Vinyl Fabric: As scheduled and indicated on Drawings.
 - h. Vinyl Color: As selected from manufacturer's standard colors.
 - i. Vinyl Color: As indicated on the Drawings.
 5. Upper Curtains:
 - a. Materials: VCP mesh, with woven vinyl encapsulated polyester yarns, 50 percent plus open grid weave.
 - b. Hoist Line Location Reinforcement: Solid vinyl fabric strips, 6 inches (154 mm) wide, welded to the VCP mesh.
 - c. Top Pocket: Solid vinyl fabric welded to top edge of VCP mesh to form pocket hem that accommodates tube batten for curtain support.
 - d. Curtain Color: As selected from manufacturer's standard colors.
 - e. Curtain Color: As scheduled and indicated on Drawings.
- C. Gymnasium Divider Curtains: Model IP880 Roll-Up Gymnasium Divider Curtains as manufactured by IPI by Bison.

1. Fire Resistance:
 - a. UL 214 and NFPA 701: Rated as self-extinguishing.
 - b. California State Fire Marshall: Registered as approved.
 2. Opening Height, Width: As scheduled and indicated on Drawings.
 3. Design: Rolling action.
 4. Hoist Belts: 3 inches (76 mm) wide nylon belt, attached to top batten pipe; run down the face of curtain; below the steel pipe; up the back side of curtain and terminate at individual drums formed on the drive pipe shaft above the curtain.
 5. Hoist Belt Spacing: Not exceeding 16 ft (4877 mm) on center.
 6. Drive Pipe Shafts: 2-3/8 inches (60 mm) diameter.
 7. Bottom Tube Battens: 13-1/2 inches (89 mm) diameter steel tubes.
 8. Top Tube Battens: 1-5/8 inches (41 mm) diameter, suspended from each drive pipe support assembly with adjustable 2/0 chain.
 9. Electrical Operation of Drive Shaft:
 - a. Power Unit: Compensating type, 115 Volt, single phase, reversible motor with built-in thermal overload protection.
 - b. Speed Reduction: Through load holding worm gears.
 - c. Remote Control Operation: Includes integral limit switch to control upper and lower limit of curtain travel.
 - d. Horsepower: 3/4.
 - e. Horsepower: 1.
 - f. Horsepower: As scheduled and indicated on Drawings.
 - g. Lower Curtain Height: Standard, 96 inches (2438 mm).
 - h. Lower Curtain Height: As scheduled and indicated on Drawings.
 - i. Materials: Flame retardant polyester reinforced solid vinyl fabric with anti-bacterial and fungi-resistant treatment.
 - j. Seams and Outer Edge Hems: Electronically welded, 1 inch (25 mm) full contact weld.
 - k. Vinyl Fabric: 18 ounces per square yard.
 - l. Vinyl Fabric: 22 ounces per square yard.
 - m. Vinyl Fabric: As scheduled and indicated on Drawings.
 - n. Vinyl Color: As selected from manufacturer's standard colors.
 - o. Vinyl Color: As indicated on the Drawings.
 10. Upper Curtains:
 - a. Materials: VCP mesh, with woven vinyl encapsulated polyester yarns, 50 percent plus open grid weave.
 - b. Top Pocket: Solid vinyl fabric welded to top edge of VCP mesh to form pocket hem that accommodates tube batten for curtain support.
 - c. Curtain Color: As selected from manufacturer's standard colors.
 - d. Curtain Color: As scheduled and indicated on Drawings.
- D. Electrically Operated Controls: As manufactured for IPI by Bison.
1. Controls: Standard, 3 position key switch, momentary contact wall control switch to lower, raise, and stop curtains.
 - a. Keys: Two keys provided to Owner for each lock.
 - b. Cover Plates: Stainless steel, with up/down markings.
 2. Controls: Model IPGCPLUS Gym Command Plus Programmable Touch Screen Operating System for Gymnasiums as manufactured for IPI by Bison.
 - a. Flush wall mounted 7 inch (178 mm) diagonal touch screen.
 - b. UL listed 12 x 16 x 4 inch (305 x 406 x 102 mm) steel relay boxes each capable of controlling up to 8 devices. Requires 120-volt, 30-amp single phase power source.
 - c. Use multiple relay boxes for operating additional devices.
 - d. Control system allows for operation of single or multiple groups of devices at the same time.
 - e. Easily programmable in the field.

- f. Touch screens are password protected.
- g. Allows installation of multiple touch screens.
- 3. Controls: Model IPGCS7 Gym Command 7 Control System as manufactured for IPI by Bison.
 - a. Touch Screens: Wall mounted, 115 volt, UL Listed, 7 inches (178 mm), color, high resolution touch screen.
 - b. Control Panels: 115 volt hardwire from control panel to each device.
 - c. Operations: Factory programmed but field reprogrammable.
 - d. Device Capacity: 8.
 - e. Device Capacity: 16.
 - f. Device Capacity: 24.
 - g. Device Capacity: 32.
 - h. Device Capacity: As scheduled and indicated on Drawings.
- 4. Controls: Goal Tender II Wireless Remote Transmitter and Receiver Systems for Gymnasium Device Operation as manufactured by LynRus for IPI by Bison.
 - a. Transmitters: Model IPGTS99LR as manufactured by IPI by Bison; handheld 9-volt battery, operated operates up to 99 separate devices.
 - b. Receivers: One IPGTS1LR required for each electric device.
- 5. Controls: As scheduled and indicated on Drawings.

2.6 MULTI-SPORT PRACTICE CAGES

- A. Multi-Sport Practice Cages: Model IP860 Multi-Sport Practice Cage as manufactured by IPI by Bison.
 - 1. Multi-Sport Practice Cage: Model IP860 Multi-Sport Practice Cage.
 - 2. Size (HxWxL): Standard, 10 x 10 x 70 ft (3048 x 3048 x 21366 mm).
 - 3. Size: As scheduled and indicated on Drawings.
 - 4. Design: 2 velcro corners allow 1 long side wall to be raised for multiple activities.
 - 5. Netting: 7/8 inch (22 mm) square mesh black golf netting, can be stored on frame.
 - 6. Frame: 1-5/16 inches (33 mm) OD galvanized steel pipe.
 - 7. Tee and Corner Fittings: Malleable cast iron, 95 percent recycled steel, iron scrap.
 - 8. Hoist Lines: 1/8 inch (3 mm) diameter steel aircraft cable, spacing not exceeding 10 ft (3048 mm) on center, attached to pipe frame below and terminate at the individual drums formed on the drive pipe shaft above the cage.
 - 9. Drive Pipe Shafts: 2-3/8 inches (60 mm) diameter.
 - 10. Electrical Operation of Drive Shaft:
 - a. Power Unit: Compensating type, 115 Volt, single phase, reversible motor with built-in thermal overload protection.
 - b. Speed Reduction: Through load holding worm and worm gears.
 - c. Remote Control Operation: Includes integral limit switch to control upper and lower limit of curtain travel.
 - d. Horsepower: 3/4.
 - e. Horsepower: 1.
 - f. Horsepower: As scheduled and indicated on Drawings.
- B. Electrically Operated Controls: As manufactured for IPI by Bison.
 - 1. Controls: Standard, 3 position key switch, momentary contact wall control switch to lower, raise, and stop curtains.
 - a. Keys: Two keys provided to Owner for each lock.
 - b. Cover Plate: Stainless steel, with up/down markings.
 - 2. Controls: Model IPGCPLUS Gym Command Plus Programmable Touch Screen Operating System for Gymnasiums as manufactured for IPI by Bison.
 - a. Flush wall mounted 7 inch (178 mm) diagonal touch screen.
 - b. UL listed 12 x 16 x 4 inch (305 x 406 x 102 mm) steel relay boxes each capable of controlling up to 8 devices. Requires 120-volt, 30-amp single phase power source.

- c. Use multiple relay boxes for operating additional devices.
 - d. Control system allows for operation of single or multiple groups of devices at the same time.
 - e. Easily programmable in the field.
 - f. Touch screens are password protected.
 - g. Allows installation of multiple touch screens.
3. Controls: Model IPGCS7 Gym Command 7 Control System as manufactured by IPI by Bison.
- a. Touch Screen: Wall mounted, 115 volt, UL Listed, 7 inches (178 mm), color, high resolution touch screen.
 - b. Control Panel: 115 volt hardwire from control panel to each device.
 - c. Operation: Factory programmed but field reprogrammable.
 - d. Device Capacity: 8.
 - e. Device Capacity: 16.
 - f. Device Capacity: 24.
 - g. Device Capacity: 32.
 - h. Device Capacity: As scheduled and indicated on Drawings.
4. Controls: Goal Tender II Wireless Remote Transmitter and Receiver Systems for Gymnasium Device Operation as manufactured by LynRus for IPI by Bison.
- a. Transmitter: Model IPGTS99LR as manufactured by IPI by Bison; handheld 9-volt battery, operated operates up to 99 separate devices.
 - b. Receiver: One IPGTS1LR required for each electric device.
5. Controls: As scheduled and indicated on Drawings.

2.7 VOLLEYBALL SYSTEMS

- A. Volleyball Systems: Ceiling Suspended as manufactured by IPI by Bison.
- 1. Model: IPV4000 ceiling suspended retractable volleyball system without judge's platform as manufactured by IPI by Bison.
 - 2. Model: IPV4000J ceiling suspended retractable volleyball system with judge's platform as manufactured by IPI by Bison.
 - a. Judges Platforms: Installed at same time as complete system.
 - 1) Mounting: Platform welded between main frame drop assembly and net attachment post, mounted 44 inches (1118 mm) above playing surface.
 - 2) Size: Nominal 24 x 24 inches (610 x 610 mm).
 - 3) Padding: Applied to platforms and safety rails to a minimum height of 66 inches (1676 mm) per NCAA and NFHS rules, black.
 - 4) Capacity: Capable of supporting 300 lbs (136 kg).
 - 5) Retractable Ladders: Attached to the judge's platforms for access.
 - 3. Main Frame Drop Assemblies: Fully welded, 4-1/2 inch (114 mm) OD pipe, 1-1/2 inches (39 mm) schedule 10 pipe.
 - a. Vertical Structural Drop Frame Truss Assemblies: 1/4 x 2 inch (6 x 51 mm) steel welded to a 2 x 4 inches (51 x 102 mm) x 1/4 inch (6 mm) wall rectangular tube horizontal member.
 - b. Adjustability: 1 inch (25 mm) diameter, 10 inches (254 mm) long threaded eyebolts to provide adjustability to level the drop frame at installation.
 - 4. Bearings: Pivot points operate on precision fit bronze, oilless type bearings.
 - 5. Steel Support Structures: Drop frames suspended from super structure.
 - a. Support Pipes: 3 inches (76 mm) schedule 40 steel pipe, 3-1/2 inches (89 mm) OD, for applications with building members spaced under 16 ft (4877 mm).
 - b. Support Pipes: 3 inches (76 mm) schedule 40 steel pipe, 3-1/2 inches (89 mm) OD, reinforced with 1-1/2 inches (39 mm) schedule 40 steel pipe and 1/4 inch (6 mm) x 2 inches (51 mm) steel cross members to form rigid horizontal support truss for applications with building members spaced over 16 ft (4877 mm).
 - c. Support Pipes: Custom fabricated drop cradles for applications with sloped structure or excessive heights, as scheduled and indicated on Drawings.

- d. Support Pipes: As scheduled and indicated on Drawings.
 - e. Finishing: Black powder coating.
 - f. Finishing: As scheduled and indicated on Drawings.
6. Folding Braces: Steel hinged pipe assemblies, 2 inches (51 mm) schedule 40 steel pipe, 2-3/8 inches (60 mm) outside diameter OD; positioned to provide structural support when drop frame is in lowered position but automatically hinged when being retracted into the ceiling when system not in use.
7. Nets: Black polypropylene 0.14 inch (3.5 mm) knotless, woven webbing.
- a. Height: 39.4 inches (1000 mm).
 - b. Top Cables: 0.16 inch (4 mm) coated stainless steel.
 - c. Bottom Ropes: 0.24 inch (6 mm) rope, tightened by means of a ratchet style rope tensioner.
 - d. Borders: White vinyl coated fabric.
 - e. Top and Bottom Ropes: Covered by no less than 1/2 inch (13 mm) thick foam padding with a white vinyl cover, between net and vertical structure.
8. Standards/Posts:
- a. Materials: 4 inch (102 mm) OD aluminum with adjustable foot pad
 - b. Net Tensioning: Vertical miter gear winch mounted inside drop frame to provide up to 250 lbs (114 kg) of tension to the top net cable.
 - c. Net Height Adjustability: Infinitely variable from 72 to 98 inches (1829 to 2489 mm).
 - d. Height Adjustment Mechanisms: Sliding track located on inside of each net attachment post.
 - e. Locking: Hand operated track locking device maintains desired net height.
9. Padding: Applied to a height of 66 inches (1676 mm) to meet all applicable rules.
- a. Vinyl Cover Color: As selected from manufacturer's standard colors.
 - b. Vinyl Cover Color: As indicated on the Drawings.
10. Electric Hoists: Model IPV974LR as manufactured by LynRus for IPI by Bison.
- a. Description: Single gear driven 1 HP electric hoist with dual cable take up drums designed to hold both main frame drop assemblies at any position during raising or lowering.
 - b. Motors: Standard, 115 Volt, single phase, UL Listed, instantly reversible with 20 minute duty cycle.
 - c. Motors: As scheduled and indicated on Drawings.
 - d. Limit Switches: Rotary type, repeatable stop at raised and lowered positions.
 - e. Gears: Hardened steel, positive locking, double reduction worm, worm wheel.
 - f. Cable Take Up Drums: 4-1/2 inches (114 mm) outside diameter with cable take-up grooves; 60 ft (18288 mm) cable capacity.
 - g. Lifting Capacity: 1250 lbs (567 kg) at 9 ft (2743 mm) per minute.
 - h. Cables: 1/4 inch (6 mm) diameter, galvanized, 6x19 strand core aircraft cable.
 - i. Gear Boxes: Fully enclosed, self-lubricating, ball bearing supported.
 - j. Mounting: Clamps to 3-1/2 inches (89 mm) outside diameter ceiling suspended structural pipe.
11. Controls: Standard, 3 position key switch, momentary contact wall control switch to lower, raise, and stop backstop.
- a. Keys: Two keys provided to Owner for each lock.
 - b. Cover Plates: Stainless steel, with up/down markings.
12. Controls: Model IPGCPLUS Gym Command Plus Programmable Touch Screen Operating System for Gymnasiums as manufactured for IPI by Bison.
- a. Flush wall mounted 7 inch (178 mm) diagonal touch screen.
 - b. UL listed 12 x 16 x 4 inch (305 x 406 x 102 mm) steel relay boxes each capable of controlling up to 8 devices. Requires 120-volt, 30-amp single phase power source.
 - c. Use multiple relay boxes for operating additional devices.
 - d. Control system allows for operation of single or multiple groups of devices at the same time.

- e. Easily programmable in the field.
 - f. Touch screens are password protected.
 - g. Allows installation of multiple touch screens.
13. Controls: Model IPGCS7 Gym Command 7 Control System as manufactured by IPI by Bison.
- a. Touch Screens: Wall mounted, 115 volt, UL Listed, 7 inches (178 mm), color, high resolution touch screen.
 - b. Control Panels: 115 volt hardwire from control panel to each device.
 - c. Operation: Factory programmed but field reprogrammable.
 - d. Device Capacity: 8.
 - e. Device Capacity: 16.
 - f. Device Capacity: 24.
 - g. Device Capacity: 32.
 - h. Device Capacity: As scheduled and indicated on Drawings.
14. Controls: Goal Tender II Wireless Remote Transmitter and Receiver Systems for Gymnasium Device Operation as manufactured by LynRus for IPI by Bison.
- a. Transmitters: Model IPGTS99LR as manufactured by IPI by Bison; handheld 9-volt battery, operated operates up to 99 separate devices.
 - b. Receivers: One IPGTS1LR required for each electric device.
15. Controls: As scheduled and indicated on Drawings.
16. Safety Locks: Model BA950LR as manufactured LynRus for IPI by Bison.
- a. Operation: Inertia sensitive mechanism automatically locks backstop in position at any time during storage, raising or lowering, due to a sudden surge of speed created by cable breakage or other failure, for each suspended unit.
 - b. Single Failure Use: Equipment failure activates device; replacement required.
 - c. Housing: Fully enclosed, cast aluminum.
 - d. Safety Strips: 6000 lbs (2722 kg) capacity, 2 inches (51 mm) wide polyester strap; 35 ft (10668 mm) strap capacity.
 - e. Mounting: Mounts to 3-1/2 inches (89 mm) outside diameter ceiling suspended structural pipe with clamps provided by manufacturer.
- B. Volleyball Systems: Centerline Elite Aluminum Series as manufactured by IPI by Bison.
1. Model: VB1000NS competition aluminum volleyball system without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without.
 2. Model: VB1000 competition aluminum volleyball system with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without; 2 floor sockets.
 3. Model: VB1002NS side-by-side competition aluminum volleyball systems without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch.
 4. Model: VB1002 side-by-side competition aluminum volleyball systems with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Application: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch; 3 floor sockets.
 5. Floor Plates: Machined cast brass with a hinged lid.
 6. Floor Plates: Chrome plated steel with swivel lid.
 7. Floor Plates: Chrome plated cast brass with hinged lid.
 8. Floor Plates: Locking cast brass with hinged lid.
 9. Floor Plates: As scheduled and indicated on Drawings.
 10. Standards/Posts:
 - a. Telescoping design ensures no portion of the standard protrudes above top of

- net at any height setting.
 - b. Assembly: Pin in outer tube rides in a machined slot in inner pole to prohibit inner tube from rotating or separating from outer tube.
 - c. Materials: 6063-T6 aluminum extrusion shapes.
 - d. Height Adjustment Mechanisms: One threaded hand knob.
 - e. Locking: Detent locking pin for use at men's, women's and junior heights.
 - f. Non-Winch Standards: 34 lbs (15.4 kg) maximum.
 - g. Winch End Standards: 39 lbs (17.7 kg) maximum.
 - h. Outer Tubes: Extruded flat surface on inside diameter to prevent inner pole rotation.
 - 1) Outside Diameter: 3 inches (76 mm).
 - 2) Wall Thickness: 0.32 inches (8 mm) minimum.
 - 3) Finishing: Textured Silver/gray powder coating.
 - 4) Bottoms of Outer Tubes: Fitted with threaded adjustment assembly with non-marking rubber footpad for fine tuning pole height and prevent damage.
 - i. Inner Tubes: Extruded in shape that fits inside outer pole.
 - 1) Wall Thickness: 0.4 inches (10 mm) minimum.
 - 2) Machined Markings: For men's, women's and juniors playing heights.
 - 3) Finishing: Clear anodized.
11. Winches:
- a. Machined aluminum body winch winds 2 inches (51 mm) wide nylon webbing strap to tension net top rope. Winch carries a lifetime warranty.
 - b. Shafts: Rotate in sealed ball bearings.
 - c. Worm Gears: 26 to 1 ratio, case hardened steel, mounted on one pole.
 - d. Handles: Non-removable, folding.
12. Nets: Black polypropylene, 0.14 inches (3.5 mm) knotless woven webbing, includes zippered net storage bag and official boundary antennas.
- a. Height: 39.4 inches (1000 mm).
 - b. Top Ropes: Kevlar. Rests in grooves of dome shaped aluminum rope guide on top of each standard.
 - c. Bottom Ropes: Polypropylene, tightened with ratchet style rope tensioners
 - d. Top and Bottom Ropes: Covered for player safety between standards and net edges by foam padding with white vinyl cover, at least 1/2 inch (13 mm) thick.
 - e. Side Tapes: Internal fiberglass dowels tensioned by means of no less than 2 ratchet style rope tensioners.
 - f. Top, Bottom and Sides: Finished with white-coated tarpaulin fabric with double stitched hemmed edges.
13. Padding: High-density foam with vinyl cover.
- a. Height: 72 inches (1829 mm) minimum.
 - b. Thickness: 1-1/2 inches (39 mm).
 - c. Letter printing or custom graphics available.
 - d. Vinyl Cover Color: As scheduled or indicated on drawings.
14. Officials Stand Platform: See "Officials Stand Platform" Paragraph under this Article.
- C. Volleyball Systems: Match Point Aluminum Series as manufactured by IPI by Bison.
- 1. Model: VB6000NS aluminum volleyball/tennis/pickleball system without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without.
 - 2. Model: VB6000 aluminum volleyball/tennis/pickleball system with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without; 2 floor sockets.
 - 3. Model: VB6002NS side-by-side aluminum volleyball/tennis/pickleball systems without floor sockets as manufactured by IPI by Bison.

- a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch.
 4. Model: VB6002 side-by-side aluminum volleyball/tennis/pickleball systems with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Application: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch; 3 floor sockets.
 5. Floor Plates: Machined cast brass with a hinged lid.
 6. Floor Plates: Chrome plated steel with swivel lid.
 7. Floor Plates: Chrome plated cast brass with hinged lid.
 8. Floor Plates: Locking cast brass with hinged lid.
 9. Floor Plates: As scheduled and indicated on Drawings.
 10. Standards/Posts:
 - a. Net adjusting tracks running the full length of poles.
 - b. Materials: 6063-T6 aluminum extrusion shapes.
 - c. Outside Diameter: 3-1/2 inches (89 mm).
 - d. Finishing: Textured silver/gray powder coating.
 - e. Tops and Bottoms of Poles: Fitted with plastic floor protective inserts.
 - f. Height Adjustment Mechanisms: 1 threaded hand knob per standard.
 - g. Non-Winch Standards: 39 lbs (17.7 kg) maximum.
 - h. Winch End Standards: 43 lbs (19.5 kg) maximum.
 11. Winches:
 - a. Machined aluminum body winch winds 2 inches (51 mm) wide nylon webbing strap to tension net top rope. Winch carries a 10-year warranty.
 - b. Shafts: Rotate in sealed ball bearings.
 - c. Worm Gears: 26 to 1 ratio, case hardened steel, mounted on one pole.
 - d. Handles: Non-removable, folding.
 12. Nets: Black polypropylene, 0.14 inches (3.5 mm) knotless woven webbing, includes zippered net storage bag and official boundary antennas.
 - a. Height: 39.4 inches (1000 mm).
 - b. Top Ropes: Kevlar.
 - c. Bottom Ropes: Polypropylene, tightened with ratchet style rope tensioners.
 - d. Top and Bottom Ropes: Covered for player safety between standards and net edges by foam padding with white vinyl cover, at least 1/2 inch (13 mm) thick.
 - e. Side Tapes: Tightened by no less than two ratchet style rope tensioners.
 13. Padding: High-density foam with vinyl cover.
 - a. Height: 72 inches (1829 mm) minimum.
 - b. Thickness: 1-1/2 inches (39 mm).
 - c. Letter printing or custom graphics available.
 - d. Vinyl Cover Color: As scheduled or indicated on the Drawings.
 14. Officials Stand Platform: See "Officials Stand Platform" Paragraph under this Article.
- D. Volleyball Systems: CarbonLite Carbon Fiber Series as manufactured by IPI by Bison.
1. Model: VB7222NS carbon fiber composite volleyball system without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without.
 2. Model: VB7222 carbon fiber composite volleyball system with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with a winch and 1 without; 2 floor sockets.
 3. Model: VB7202NS side-by-side carbon fiber composite volleyball systems without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch.
 4. Model: VB7202 side-by-side carbon fiber composite volleyball systems with extruded

- aluminum floor sockets as manufactured by IPI by Bison.
- a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch; 3 floor sockets.
5. Floor Plates: Machined cast brass with a hinged lid.
 6. Floor Plates: Chrome plated steel with swivel lid.
 7. Floor Plates: Chrome plated cast brass with hinged lid.
 8. Floor Plates: Locking cast brass with hinged lid.
 9. Floor Plates: As scheduled and indicated on Drawings.
 10. Standards/Posts:
 - a. Telescoping design ensures that no portion of the standard protrudes above top of net at any height setting.
 - b. Assembly: Pin in outer tube rides in a machined slot in inner pole to prohibit inner tube from rotating or separating from outer tube.
 - c. Materials: Mandrel wound, high modulus carbon fiber composite.
 - d. Height Adjustment Mechanisms: 1 threaded hand knob per standard.
 - e. Locking: Detent locking pin for use at men's, women's and junior heights.
 - f. Non-Winch Standards: 17 lbs (7.7 kg) maximum.
 - g. Winch End Standards: 22 lbs (10 kg) maximum.
 - h. Outer Tubes: Extruded flat surfaces on inside diameter to prevent inner pole rotation.
 - 1) Outside Diameter: 3 inches (76 mm).
 - 2) Wall Thickness: 0.24 inches (6.1 mm) minimum.
 - 3) Bottoms of Outer Tubes: Fitted with threaded adjustment assembly with non-marking rubber footpad for fine tuning pole height and prevent damage.
 - i. Inner Tubes: Machined surface for smooth telescoping action.
 - 1) Outside Diameter: 2-1/2 inches (64 mm).
 - 2) Wall Thickness: 0.25 inches (6 mm) minimum.
 - 3) Machined Markings: For men's, women's and juniors playing heights.
 11. Winches:
 - a. Machined aluminum body winch winds 2 inches (51 mm) wide nylon webbing strap to tension net top rope. Winch carries a lifetime warranty.
 - b. Shafts: Rotate in sealed ball bearings.
 - c. Worm Gears: 26 to 1 ratio, case hardened steel, mounted on one pole.
 - d. Handles: Non-removable, folding.
 12. Nets: Black polypropylene, 0.14 inches (3.5 mm) knotless woven webbing, includes zippered net storage bag and official boundary antennas.
 - a. Height: 39.4 inches (1000 mm).
 - b. Top Ropes: Kevlar, rest in grooves of dome shaped aluminum rope guide on top of each standard.
 - c. Bottom Ropes: Polypropylene, tightened with ratchet style rope tensioners.
 - d. Top and Bottom Ropes: Covered for player safety between standards and net edges by foam padding with white vinyl cover, at least 1/2 inch (13 mm) thick.
 - e. Side Tapes: Internal fiberglass dowels tensioned by means of no less than 2 ratchet style rope tensioners.
 - f. Top, Bottom and Sides: Finished with white-coated tarpaulin fabric with double stitched hemmed edges.
 13. Padding: High-density foam with vinyl cover.
 - a. Height: 72 inches (1829 mm) minimum.
 - b. Thickness: 1-1/2 inches (39 mm).
 - c. Letter printing or custom graphics available.
 - d. Vinyl Cover Color: As scheduled or indicated on drawings.
 14. Officials Stand Platform: See "Officials Stand Platform" Paragraph under this Article.
- E. Volleyball Systems: Centerline Elite Hybrid Series as manufactured by IPI by Bison.

1. Model: VB2000NS hybrid steel volleyball system without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without.
2. Model: VB2000 hybrid steel volleyball system with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with a winch and 1 without; 2 floor sockets.
3. Model: VB2002NS side-by-side hybrid steel volleyball systems without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch.
4. Model: VB2002 side-by-side hybrid steel volleyball systems with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch; 3 floor sockets.
5. Floor Plates: Machined cast brass with a hinged lid.
6. Floor Plates: Chrome plated steel with swivel lid.
7. Floor Plates: Chrome plated cast brass with hinged lid.
8. Floor Plates: Locking cast brass with hinged lid.
9. Floor Plates: As scheduled and indicated on Drawings.
10. Standards/Posts:
 - a. Telescoping design ensures that no portion of the standard protrudes above top of net at any height setting.
 - b. Assembly: Pin in outer tube rides in a machined slot in inner pole to prohibit inner tube from rotating or separating from outer tube.
 - c. Materials: 6063-T6 aluminum extrusion shapes.
 - d. Height Adjustment Mechanisms: 1 threaded hand knob per standard.
 - e. Locking: Detent locking pin for use at men's, women's and junior heights.
 - f. Non-Winch Standards: 61 lbs (27.7 kg) maximum.
 - g. Winch End Standards: 66 lbs (30 kg) maximum.
 - h. Outer Tubes: Steel.
 - 1) Outside Diameter: 3 inches (76 mm).
 - 2) Wall Thickness: 0.22 inch (5.6 mm) minimum.
 - 3) Finishing: Textured Silver/gray powder coating.
 - 4) Bottoms of Outer Tubes: Fitted with threaded adjustment assembly with non-marking rubber footpad for fine tuning pole height and prevent damage.
 - i. Inner Tubes: 6061-T6 aluminum.
 - 1) Outside Diameter: 2-1/2 inches (64 mm).
 - 2) Wall Thickness: 0.21 inch (5.3 mm) minimum.
 - 3) Machined Markings: For men's, women's and juniors playing heights.
11. Winches:
 - a. Winches: Machined aluminum body winch winds 2 inches (51 mm) wide nylon webbing strap to tension net top rope. Winch carries a lifetime warranty.
 - b. Winch Shafts: Rotate in sealed ball bearings.
 - c. Worm Gears: 26 to 1 ratio, case hardened steel, mounted on one pole.
 - d. Handles: Non-removable, folding.
12. Nets: Black polypropylene, 0.14 inches (3.5 mm) knotless woven webbing, includes zippered net storage bag and official boundary antennas.
 - a. Height: 39.4 inches (1000 mm).
 - b. Top Ropes: Kevlar, rest in grooves of dome shaped aluminum rope guide on top of each standard.
 - c. Bottom Ropes: Polypropylene, tightened with ratchet style rope tensioners.
 - d. Top and Bottom Ropes: Covered for player safety between standards and net

- e. edges by foam padding with white vinyl cover, at least 1/2 inch (13 mm) thick.
 - e. Side Tapes: Internal fiberglass dowels tensioned by means of no less than 2 ratchet style rope tensioners.
 - f. Top, Bottom and Sides: Finished with white-coated tarpaulin fabric with double stitched hemmed edges.
13. Padding: High-density foam with vinyl cover.
 - a. Height: 72 inches (1829 mm) minimum.
 - b. Thickness: 1-1/2 inches (39 mm).
 - c. Letter printing or custom graphics available.
 - d. Vinyl Cover Color: As scheduled or indicated on drawings.
 14. Officials Stand Platform: See "Officials Stand Platform" Paragraph under this Article.
- F. Volleyball Systems: Centerline EZ Aluminum Series as manufactured by IPI by Bison.
1. Model: VB1100NS infinitely adjustable aluminum volleyball system without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without.
 2. Model: VB1100 infinitely adjustable aluminum volleyball System with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for a single court.
 - b. Description: 2 standards, 1 with winch and 1 without; 2 floor sockets.
 3. Model: VB1102NS side-by-side infinitely adjustable aluminum volleyball systems without floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch.
 4. Model: VB1102 side-by-side infinitely adjustable aluminum volleyball systems with extruded aluminum floor sockets as manufactured by IPI by Bison.
 - a. Applications: Suitable for setup for multiple courts.
 - b. Description: 3 standards, 2 with winches, 1 center standard without a winch; 3 floor sockets.
 5. Floor Plates: Machined cast brass with a hinged lid.
 6. Floor Plates: Chrome plated steel with swivel lid.
 7. Floor Plates: Chrome plated cast brass with hinged lid.
 8. Floor Plates: Locking cast brass with hinged lid.
 9. Floor Plates: As scheduled and indicated on Drawings.
 10. Standard/Posts:
 - a. Telescoping design ensures that no portion of the standard protrudes above top of net at any height setting.
 - b. Assembly: Pin in outer tube rides in a machined slot in inner pole to prohibit inner tube from rotating or separating from outer tube.
 - c. Materials: 6063-T6 aluminum extrusion shapes.
 - d. Height Adjustment Mechanisms: 1 threaded hand knob per standard, plus internal lead screw for infinitely adjustable net height.
 - e. Locking: Detent locking pin for use at men's, women's and junior heights.
 - f. Non-Winch Standards: 39 lbs (17.7 kg) maximum.
 - g. Winch End Standards: 44 lbs (20 kg) maximum.
 - h. Outer Tubes: Extruded flat surfaces on inside diameter to prevent inner pole rotation.
 - 1) Outside Diameter: 3 inches (76 mm).
 - 2) Wall Thickness: 0.32 inch (8 mm) minimum.
 - 3) Finishing: Silver/gray powder coating.
 - 4) Bottoms of Outer Tubes: Fitted with threaded adjustment assembly with non-marking rubber footpad for fine tuning pole height and prevent damage.
 - i. Inner Tubes: Extruded in shape that fits inside outer pole.
 - 1) Wall Thickness: 0.4 inch (10 mm) minimum.

- 2) Machined Markings: For men's, women's and juniors playing heights.
 - 3) Finishing: Clear anodized.
11. Winches:
- a. Winches: Machined aluminum body winch winds 2 inches (51 mm) wide nylon webbing strap to tension net top rope. Winch carries a lifetime warranty.
 - b. Winch Shafts: Rotate in sealed ball bearings.
 - c. Worm Gears: 26 to 1 ratio, case hardened steel, mounted on one pole.
 - d. Handles: Non-removable, folding.
12. Nets: Black polypropylene, 0.14 inches (3.5 mm) knotless woven webbing, includes zippered net storage bag and official boundary antennas.
- a. Height: 39.4 inches (1000 mm).
 - b. Top Ropes: Kevlar, rest in grooves of dome shaped aluminum rope guide on top of each standard.
 - c. Bottom Ropes: Polypropylene, tightened with ratchet style rope tensioners.
 - d. Top and Bottom Ropes: Covered for player safety between standards and net edges by foam padding with white vinyl cover, at least 1/2 inch (13 mm) thick.
 - e. Side Tapes: Internal fiberglass dowels tensioned by means of no less than 2 ratchet style rope tensioners.
 - f. Top, Bottom and Sides: Finished with white-coated tarpaulin fabric with double stitched hemmed edges.
13. Padding: High-density foam with vinyl cover.
- a. Height: 72 inches (1829 mm) minimum.
 - b. Thickness: 1-1/2 inches (39 mm).
 - c. Letter printing or custom graphics available.
 - d. Vinyl Cover Color: As scheduled or indicated on drawings.
14. Officials Stand Platform: See "Officials Stand Platform" Paragraph under this Article.
- G. Officials Stand Platforms: As manufactured by IPI by Bison.
1. Model: VB73 Clamp-On Volleyball Official Platform with Padding as manufactured by IPI by Bison.
- a. Platforms: 1 inch (25 mm) diameter, 11 gauge steel tube, fully welded; silver/gray powder coating.
 - b. Mounting: Platform clamps to standard without tools with hand knob tensioner.
 - c. Platform Width: No less than 21 inches (534 mm).
 - d. Platform Depth: No less than 19 inches (483 mm).
 - e. Platform Height: Adjustable from 47 to 53 inches (1194 to 1346 mm).
 - f. Handrails: Positioned no less than 33 inches (838 mm) above the platform.
 - g. Floor Pads: When in use platform rests on non-marking, anti-skid floor pads.
 - h. Wheels: Non-marking, facilitates transport and storage when not in use.
 - i. Padding: Applied to hard surfaces to a height of 72 inches (1829 mm), 1 inch (25 mm) thick high-density foam.
 - 1) Vinyl Cover Color: As selected from manufacturer's standard colors.
 - 2) Vinyl Cover Color: As indicated on the Drawings.
2. Model: VB76 Freestanding Folding Volleyball Official Platform with Padding as manufactured by IPI by Bison.
- a. Platforms: 1 inch (25 mm) diameter, 11 gauge steel tube, fully welded except as required to allow folding; silver/gray powder coating.
 - b. Design: Folds for transport and storage without tools by means of two pull pins.
 - c. Floor Pads: When in use platform rests on non-marking, anti-skid floor pads.
 - d. Wheels: Non-marking, facilitates transport and storage when folded, not in use.
 - e. Platform Width: No less than 19 inches (483 mm) in width and 25 inches (635 mm) in depth and have handrails extending no less than 34 inches (864 mm) above the platform.
 - f. Padding: Applied to hard surfaces to a height of 72 inches (1829 mm), 1 inch (25 mm) thick high-density foam.
 - 1) Vinyl Cover Color: As selected from manufacturer's standard colors.

- 2) Vinyl Cover Color: As indicated on the Drawings.

2.8 GYMNASIUM WALL PADDING

- A. Gymnasium Padding: Safety padding for walls, corners, columns, doors and stages as manufactured by IPI by Bison.
 1. Protector Wall Padding as manufactured by IPI by Bison.
 - a. Foam: Polyurethane.
 - 1) Compliance:
 - a) California Fire Code TIB 117 Section 3 and FMVSS 302.
 - b) ISO 20743 Antibacterial Standards.
 - c) AATCC 30 Antifungal Standards.
 - 2) Indentation Load Deflection (ILD): ASTM D3574.
 - a) Test B1: 43-53 lbs per 50 cubic inches.
 - b) Test A: 1.50 lbs per cubic foot density.
 - 3) Thickness: 2 inch (51 mm).
 - 4) Thickness: 3 inch (76 mm).
 - b. Cover: Vinyl, 14 ounces per square yard treated for mildew and UV protection.
 - 1) Tear Strength, ASTM D2261: 92 x 83 lbs per inch (16.1 x 14.5 N per mm).
 - 2) Fire Resistance: Conforms to NFPA 701 CSFM and Class A ASTM E84.
 - c. Wood Backed Padding: Mounted on 7/16 inch (11 mm) OSB composite board with foam attached to OSB with water based adhesive.
 - d. Height: As scheduled and indicated on Drawings.
 - e. Total Lineal Feet: As scheduled and indicated on Drawings.
 2. Firewall Wall Padding as manufactured by IPI by Bison.
 - a. Fire Resistance: Assembled padding tested and passing NFPA 286 and ASTM E84 Class A fire test for wall covering.
 - b. Foam: Neoprene.
 - 1) Compliance: California Fire Code TIB 117.
 - 2) Indentation Load Deflection (ILD): ASTM D3574.
 - a) Test B1: 35 plus or minus 10 lbs.
 - b) Test A: 6.2 lbs per cubic foot density.
 - 3) Thickness: 2 inch (51 mm).
 - 4) Thickness: 3 inch (76 mm).
 - c. Cover: Leather grain vinyl, 16 oz per sq yd (542.5 gram per sq m), treated with anti-mildew and UV protection.
 - 1) Tear Strength: 75 x 75 lbs per inch (13.1 x 13.1 N/mm).
 - 2) Fire Resistance: Conforms to NFPA 701 CSFM and Class A ASTM E84.
 - d. Height: As scheduled and indicated on Drawings.
 - e. Total Lineal Feet: As scheduled and indicated on Drawings.
 3. Type: Solid color vinyl.
 - a. Vinyl Color: As selected from manufacturer's standard colors.
 - b. Vinyl Color: As indicated on the Drawings.
 4. Type: Full-color graphic printed vinyl.
 - a. Printing Process: Full five-color.
 - b. Printing Process: UV ink.
 - c. Artwork: Created by manufacturer.
 - d. Artwork: Provided to manufacturer by Architect.
 5. Type: As scheduled and indicated on Drawings.
 6. Mounting Style: Flange mount.
 7. Mounting Style: Hidden Z-track.
 8. Mounting Style: Hidden J-track.
 9. Mounting Style: Hook & loop track.
 10. Mounting Style: As scheduled and indicated on Drawings.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
 - 1. Secure to substrate with fasteners of type, size and spacing as recommended by manufacturer.
 - 2. Remove protective wrappings and labels and wash surfaces.
 - 3. Do not use harsh cleaning materials or methods that would damage finish.
 - 4. Repair minor damages to finish in accordance with manufacturer's instructions.
 - 5. Remove and replace damaged components that cannot be successfully repaired, as determined by Architect.
- B. Volleyball Equipment:
 - 1. Coordinate layout of volleyball courts and location of floor sockets with installation of floor surfacing and application of game lines and boundaries.
 - 2. Coordinate location of sleeves and required size of sleeve footing with trade responsible for placing concrete.
 - 3. Provide sleeves in adequate time to allow casting in concrete floor slabs.
 - 4. Ensure that setting of sleeve compensates for type of floor finish to be provided.
 - 5. Ensure that sleeves for each volleyball court are spaced correctly.
 - 6. Insert standards into floor socket as applicable and attach nets, boundary markers, antennae, judge's platform, protection padding, and other accessories.
 - 7. Verify that all items have been provided and are as required for complete installation.
 - 8. Verify that standards are vertical and rigid. Verify net height settings are accurate.
 - 9. Provide missing items and correct deficiencies.
- C. Basketball Backstops:
 - 1. Coordinate basketball backstop support with construction of and ceiling framing to ensure proper support and method of attachment.
 - 2. Install backstops, backboards, and goals plumb, level, and rigid.
 - 3. Coordinate support of backstops to ensure proper distribution of loads and adequacy of attachment points. Provide additional structural framing members as required.
 - 4. After installing, verify that mounting height is correct.
 - 5. Operate a minimum of three times to ensure proper lifting and lowering. Adjust as required to ensure smooth operation and accurate positioning.
 - 6. Coordinate electrical requirements to ensure proper power source, conduit, wiring, and boxes for keyed switches.

3.3 DEMONSTRATION AND TRAINING

- A. Demonstrate to Owner's designated representative complete operation and required maintenance of installed equipment.

3.4 CLEANING AND PROTECTION

- A. Clean and protect products in accordance with the manufacturer's recommendations.

END OF SECTION