ALBUQUERQUE PUBLIC SCHOOLS

Facilities Design + Construction / Maintenance & Operation

Playground Standards, Specifications and Standard Details for Playground Construction

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ALBUQUERQUE PUBLIC SCHOOLS

Facilities Design + Construction

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Playground Equipment and Supervision Standards

A. SUMMARY

1. Albuquerque Public Schools (APS) has adopted as its playground safety standards, the most current editions of the U. S. Consumer Products Safety Commission's (CPSC) "Public Playground Safety Handbook"; ASTM International (ASTM) Standard F1487 for Standard Consumer Safety Performance Specification for Playground Equipment for Public Use; and the Americans with Disabilities Act (ADA) Accessibility Guidelines for Play Areas and the Americans with Disability Guideline for Buildings and Facilities. The purpose of this directive is to develop a comprehensive plan of action to comply with existing standards (CPSC and ASTM) and playground laws (ADA) to prevent accidents on playgrounds caused by known serious hazards that are correctable. To achieve that purpose, this directive will: (1) establish APS standards for playground equipment installation, maintenance, type of equipment used, and (2) establish minimum supervision standards for students at play on our playgrounds / campuses, thus reducing the likelihood of student injuries.

B. APPLICABILITY

1. The playground equipment standards apply to all schools with playground equipment, including schools that have child care centers with outdoor playground equipment. The supervision standards apply to <u>all</u> Albuquerque Public Schools.

C. PLAYGROUND DESIGN

1. Playgrounds shall be designed in accordance with these standards and those of APS Risk Management.
2. All designs and drawings for playgrounds on APS properties must be reviewed and approved by the APS M&O Playgrounds prior to ordering and installing equipment.
3. Playground equipment and surfacing are required to be IPEMA Certified.
4. The fall area as required by the play equipment manufacturer is required.
5. Modifications to existing playgrounds will require that surfacing, access, etc. be brought to current ADA requirements for playground accessibility. All existing playground equipment must

be audited for safety by a certified person and all non-compliant equipment must be removed.

6. Access for maintenance is required with a minimum opening of 10'-0" clear for installation, removal and maintenance of equipment.
7. Provide a minimum of 8'-0" between playground walls and other items for tractor access.
8. All APS playgrounds are required to have engineered wood fiber mulch installed as the safety surfacing. Sand is no longer allowed as a safety surfacing. A separate sand play area without equipment is allowed.
9. Utilities are not permitted to pass through – over or under – play areas. This includes water, sanitary sewer, electrical, gas, communication cables, etc.
10. Surfaces adjacent to play areas must be paved or treated to control erosion and for ease of maintenance.
11. Absolutely no site drainage or roof drainage is allowed to enter playground or play equipment containment areas. Play equipment cannot be installed within ponding areas.
12. All new playgrounds and new equipment installed within existing playgrounds shall have an age appropriate sign(s) which is provided by the equipment manufacturer and installed by the equipment installer.
13. Pre-K play areas shall have an age appropriate tot lot and equipment that is totally fenced to create a separate lot for this age group separate from other play areas.
14. All permanent playground equipment must be installed within concrete borders with ADA compliant access.
15. All new play structures must include ADA accessible play equipment. New play equipment on established play grounds must address the balance of ADA compliant equipment. ADA accessibility shall comply with the most current publication of "Guide to ADA Accessibility Guidelines for Play Areas" as published by the Architectural and Transportation Barriers Compliance Board.
16. All playgrounds must include 2-3 trash receptacles designed for exterior use.
17. Swings to be a single post type with a clamp. No insert type is acceptable. Single post swings should not exceed three (3) bays.
18. Wind and Erosion Control
    a. Hard surfacing around exterior of playground area.
    b. Containment of wood fiber is required.

c. No surface drainage or roof drains into the play area.
d. Provide drainage out of the play area.
e. Minimize "pod" play areas. Make play areas larger instead of smaller areas.

D. PLAYGROUND EQUIPMENT STANDARDS

1. All equipment shall be purchased from a playground equipment manufacturer with adequate product liability insurance. Manufacturers' representatives shall be a Certified Playground Safety Inspector (CPSI).
2. The International Playground Equipment Manufacturers Association (IPEMA) must certify all components of the purchased equipment.
3. Prohibited equipment
   a. Any equipment that fails to meet either of the current CPSC and ASTM requirements.
   b. Homemade equipment.
   c. Metal slides.
   d. Wood equipment.
   e. Trampolines (this does not include individual trampolines required by an Individual Education Plan (IEP), which are not for general use.
   f. Tires of any size.
   g. Stand up spinners may be considered but must be approved by the Playground Department supervisor.
4. Protective surfacing
   a. APS shall maintain the protective surfacing in accordance with CPSC, ASTM and IPEMA requirements.
5. Installation standards
   a. All equipment shall be installed according to manufacturer specifications and meet current industry safety standards.
   b. When new equipment is to be placed on a playground the following procedures for installation will be followed:
      1) Vendor should be CPSI certified.
      2) The installation must have on-site CPSI certified personnel to oversee the installation.
      3) No other organization or persons may install playground equipment on APS playgrounds without approval by APS personnel.
   c. All playgrounds will have signs provided by the equipment manufacturer identifying the ages appropriate to the

equipment and/or the need for adult supervision and installed by the playground installer.

E. AUDITS / INSPECTIONS / TRAINING

1. APS will provide third party safety audit of playgrounds based upon CPSC, ASTM, and ADA requirements. These will occur before any new equipment is added if the last audit is over five years old and after new equipment is installed.
2. Final payment of the installation will be approved upon completion of the safety audit.
3. The audits will categorize equipment and surfacing and will provide information about what does not meet CPSC, ASTM, and ADA requirements.
4. Audits will be conducted by CPSI individuals from companies specializing in recreation and physical education equipment inspections.
5. Inspections:
    a. Will be conducted by APS staff during the entire year.
    b. The third party auditor will use a checklist of safety criteria for each piece of equipment installed on the playground.
    c. Discrepancies that have the potential to cause an injury will be immediately taken out of service.
    d. APS Playgrounds staff will generate work orders to correct items that fail CPSC, ASTM, and ADA requirements.
6. Inspections at site
    a. Clean any litter or debris in the playground that might cause injury or be a health hazard.
    b. Note any broken equipment, place it out of service, and submit a work order to get it repaired.
    c. Check surfacing material; submit a work order for any discrepancies.
7. Final Walkthrough Meeting at the completion of the installation will include a meeting with key school personnel. The meeting should include information on how the school can conduct a team inspection and discuss how the play equipment is to be used.
8. Training: The third party safety auditor will provide two copies in a binder along with one CD showing a picture of the specific equipment that is on-site and the names of the equipment. One copy of this binder will be located at the school in the administration office and one copy will be located in the M & O Playgrounds office.

a. The catalog will include each piece of new play equipment, the name of the equipment and the warranty for each piece of equipment that is installed.
b. The training will be provided to the principal, teachers and staff of the school at which the play equipment is installed. The training will include a playground safety video and also instruction at each piece of equipment demonstrating the proper use of the equipment. The training will also include when and how to have the equipment repaired.

F. MAINTENANCE

1. The District shall provide reasonable resources to ensure prudent and timely inspections and repairs as determined necessary by this Directive.
2. All playground equipment shall be inspected, repaired, and maintained by APS employees or certified contractors on a regular basis with the necessary reporting documentation.
3. APS Maintenance and Operations shall:
   a. Provide a Playground Department to oversee, install, remove and maintain APS's playground equipment as needed.
   b. Establish a playground replacement program based on maintenance, equipment life-cycle costs and end of the warranty.
   c. Establish a scheduled maintenance plan for APS's playground equipment and protective fall surfaces.
4. The Playground Department shall:
   a. Conduct inspections of all APS playgrounds.
   b. Install or oversee installation of new playground equipment under the direction of the manufacturer's authorized representative, and in accordance with the equipment manufacturer, the CPSC, the ASTM, and the ADA.
   c. Remove or oversee removal of existing playground equipment that fails to meet CPSC, ASTM, and ADA requirements. Perform routine, preventative, and unscheduled maintenance on existing playground equipment to meet CPSC, ASTM, and ADA requirements.
   d. Conduct maintenance to all playground protective fall surfaces to bring them to the CPSC, the ASTM, and the ADA requirements.

e. Replace product-warning labels when they are no longer legible.

5. Principals or their delegates shall:
   a. Ensure daily inspections of their playgrounds are conducted in accordance with this directive.
   b. Maintain the playground area free of litter and debris that may pose a health hazard to children.
   c. Submit work orders immediately upon discovery of any equipment or protective surfacing that is not in compliance with this directive.

G. ARTIFICIAL TURF – Refer to specifications in this standard.

1. Slit Film - This is the work horse of the synthetic turf industry. Aesthetically looks more like artificial turf. Use for any athletic or play field application. Works very well for the following applications.
2. Monofilament – This is a newer turf product than slit film. Aesthetically looks more like real grass than slit film. Use for any athletic or play field application. Works very well for the following applications.

SECTION 32 31 13

Chain Link Fencing and Gates

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all labor, materials, tools and equipment necessary to install chain link fence and gates as indicated on the plans and as specified herein; including components and accessories required for a complete installation.

1.2 SUBMITTALS

A. Product Date: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain link fences.
   1. Fence posts, rails and fittings.
   2. Chain link fabric, reinforcements, and attachments.

B. Shop Drawings: Show locations of fences, posts, rails, tension wires, details of extended posts, extension arms, latches, hardware and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain link fences similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain link fences shown in the Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 CHAIN LINK FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle, or as indicated in the drawings. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below.

B. Steel Wire Fabric: Metallic-coated 9 gauge wire.
   1. Mesh Size: 2"
   2. Weight of Metallic (Zinc) Coating: ASTM A 392, Type II, Class 1, 1.2

ounce/square foot with zinc coating applied before weaving.

3. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

C. Selvage: Knuckled top and bottom, or as indicated in the drawings.

D. Wind Screen, Provide in locations if indicated on drawings or directed by APS personnel. Typical material to be ci-Permatex black mesh vinyl coated polyester fabric, with 85% opacity manufactured by ci Fabrics 800-622-7169 or approved substitution.

2.2 FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing and the following:
   1. Group IA, round steel pipe, Schedule 40.
   2. Fence Height: As indicated in the drawings or as directed by APS personnel.
   3. Strength Requirements: Light industrial according to ASTM F 1043.
   4. Post Size and Thickness: According to ASTM F 1043.
      a. Top Rail: 1-5/8 inches O.D., unless otherwise noted in the drawings.
      b. Line Post: 2-3/8 inches O.D., unless otherwise noted in the drawings.
      c. End, Corner and Pull Post: 2-7/8 inches O.D., 4.64 pounds per foot, unless otherwise noted in the drawings.
   5. Coating for Steel Framing: Type C, Zn-5-A1-MM alloy, consisting of not less than 1.8 ounce/square foot coating.

2.3 TENSION WIRE

A. General: Provide horizontal tension wire extended along bottom of fence fabric.

B. Metallic-Coated Steel Wire: 7 gauge, marcelled tension wire complying with ASTM A 817, ASTM A 824, and Type II, zinc coated (galvanized) by hot-dip process, with matching chain link fabric coating weight.

2.4 FITTINGS

A. General: Comply with ASTM F 626.

B. Post and Line Caps: Provide for each post.

C. Rail and Brace Ends: Attach rails securely to each corner, pull, and end post with fitting or by welding as indicated in the drawings or as directed by APS personnel.

D. Rail Fittings: provide the following where indicated in the drawings or directed by APS personnel:
   1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
   2. Rail Clamps: Line and corner boulevard clamps for connecting rails in the fence line-to-line posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain link fabric. Provide one bar for end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Tie Wires, Clips, and Fasteners: Standard round galvanized wire ties for attaching chain link fabric to posts, rails, and frames.

2.5 GATE MATERIALS

A. Chain Link Fabric, Framing, and Fittings: as specified in this Section.

B. Hardware:
   1. Latches: Provide latches as indicated in the drawings or as directed by APS personnel permitting operation from both sides of gate.
   2. At swing-type gates provide Manufacturer recommended hinges.

C. Gate frame and railings shall be welded as shown in the drawings.

2.6 MISCELLANEOUS MATERIALS

A. Cast-in-place Concrete: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94/C 94M.

B. Non-shrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by Manufacturer, for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.
   1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
   2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, gates and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

A. Install chain link fencing to comply with ASTM F 567 and more stringent requirements specified.

B. Install fencing on established boundary lines inside property line.

3.4 CHAIN LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacing shown in the drawings or as directed by APS personnel, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
   1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
   2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect above ground portion of posts from concrete splatter.

C. Terminal Posts: Locate terminal end, corner, and gate at 10 feet o.c. or as shown in documents or do as directed by APS personnel.

D. Line Posts: Space line posts uniformly at 10 fee o.c. or as shown in the drawings.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing.
   1. Install braces at end and gate posts and at both sides of corner and pull posts.
   2. Install intermediate rails with fittings or by welding as shown in the drawings.

F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten Fabric to tension wire with 0.120-inch diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated in the drawings before stretching fabric.
   1. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install with fittings or by welding as shown in the drawings.

H. Chain Link Fabric: Fabric for athletic fields shall be applied to the inside of posts adjacent to the field of play. Leave 1 inch between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull and gate posts with tension bands spaced not more than 15 inches o.c.

J. Tie Wire: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
   1. Maximum Spacing: Tie fabric to line posts and top rail at 12 inches o.c. and to braces at 24 inches o.c.

K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.5 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION 32 31 13

SECTION 32 18 16.16

ARTIFICIAL GRASS – MONOFILAMENT 2.25"

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all labor, materials, tools and equipment necessary to install monofilament artificial grass as indicated on the plans and as specified herein; including components and accessories required for a complete installation. including but not limited to
   1. Acceptance of prepared sub-base.
   2. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.

1.2 SUBMITTALS

A. Substitutions: Other products are acceptable if in compliance with all requirements of these specifications. Submit alternate products to Architect for approval prior to bidding in accordance Section 01 25 13, Product Substitution Procedures.
   1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
   2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.

B. Comply with Section 01 33 00, Submittals Procedures. Submit for approval prior to fabrication.

C. Shop Drawings:
   1. Indicate field layout; field marking plan and details for the specified sports; i.e., NFHS Football; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
   2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
   3. Provide joint submission with related trades when requested by Architect.

D. Product Data:
   1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
   2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
   3. Submit data in sufficient detail to indicate compliance with the contract documents.
   4. Submit manufacturer's instructions for installation.

5. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.

E. Samples: Submit samples, 6 x 6 inches, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.

F. Product Certification:
   1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
   2. Submit test results indicating compliance with Reference Standards.

G. Project Record Documents: Record actual locations of seams, drains and other pertinent information in accordance with Specifications and General Requirements.

H. List of existing installations: Submit list including respective Owner's representative and telephone number.

I. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.

J. Testing data to the Owner to substantiate that the finished field meets the required shock attenuation, as per ASTM F1936.

K. Submit Bills of Lading/Material Delivery Receipts for synthetic turf infill materials. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.

L. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
   1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
   2. Primary & Secondary Backing Weights, ASTM D5848.
   3. Tuft Bind, ASTM D1335.
   4. Grab Tear Strength, ASTM D1682 or D5034.

1.3 QUALITY ASSURANCE

A. Comply with Section 01 43 00, Quality Assurance.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
   1. Shall be experienced in the manufacture and installation of monofilament grass turf for a minimum of three years. This includes use of a monofilament fiber, and the installation method.
   2. Shall have 100 fields in play for at least two years. Fields shall be 65,000 ft² or more
   3. Turf manufacturer shall have installed a minimum of 5 fields that are at least 8 years old, which is equal to the respective warranty period.
   4. Shall have a minimum of 5 installations in the State of New Mexico.

5. Shall have a minimum of 100 installations in North America with a monofilament fiber, each field of 65,000 ft² or more.
6. Shall provide third party certification confirming minimum requirement for tuft bind.

C. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.
1. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of specified monofilament material, including sewing seams and proper installation of the infill mixture.
2. Installer shall be certified by the manufacturer and licensed.
3. The installer supervisor shall have a minimum of 5 years of experience as either a construction manager or a supervisor of synthetic turf installations

D. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.

E. The Contractor shall verify special conditions required for the installation of the system.

F. The Contractor shall notify the Architect of any discrepancies.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01 60 00, Product Requirements.

B. Prevent contact with materials that may cause dysfunction.

C. Deliver and store components with labels intact and legible.

D. Store materials/components in a safe place, under cover, and elevated above grade.

E. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.

F. Inspect all delivered materials and products to ensure they are undamaged and in good condition.

1.5 SEQUENCING AND SCHEDULING

A. Coordinate the Work with installation of work of related trades as the Work proceeds.

B. Sequence the Work in order to prevent deterioration of installed system.

1.6 WARRANTY AND GUARANTEE

A. See Section 01780 - Closeout Submittals, For Additional Warranty Requirements.

B. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; prepaid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:

1. Pre-Paid 8-year insured warranty.
2. Insured Warranty Coverage must be provided in the form of 1 single policy
3. Maximum per claim coverage amount of at least $10,000,000.
4. Minimum of fifteen million dollar ($15,000,000) annual aggregate
5. Must cover full 100% replacement value of total square footage installed, minimum of $7.00 per sq. ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
6. Policies that include self-insurance or self-retention clauses shall not be considered.
7. Policy cannot include any form of deductible amount.
8. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.

C. The artificial grass system must maintain a G-max of less than 200 for the life of the Warranty as per ASTM F1936. Testing will be performed by a third party that specializes in this type of testing.

1.7 MAINTENANCE SERVICE

A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.

B. Manufacturer must provide maintenance guidelines to the facility maintenance staff.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. Approved manufacturers are as follows:

1. FieldTurf USA
   175 N. Industrial Blvd
   Calhoun, GA 30701
   P: 303-775-6773

   Model: FieldTurf XM6-57

2. ProGrass LLC
   960 Penn Avenue, 8th Floor
   Pittsburgh, PA 15222
   P: 412-434-6003

   Model: GameTurf – with 3lbs rubber, 3lbs sand

2. Shaw Sports Turf
   185 South Industrial Blvd
   Calhoun, GA 30701
   P: 770-795-1159

   Model: Shaw Powerblade HP – with 3lbs rubber, 3lbs sand

2.2 MATERIALS AND PRODUCTS – BASE BID

A. Artificial grass system materials shall consist of the following:
   1. Carpet made of monofilament polyethylene fibers tufted into a perforated backing.
   2. Infill: Graded sand and rubber crumb that partially covers the carpet.
   3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass monofilament turf.

B. The installed artificial grass monofilament turf shall have the following minimum properties:

Standard	Property	Specification
ASTM D1577	Fiber Denier	9,000+
ASTM D3218	Tape Thickness	200 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/8" - 3/4"
ASTM D5848	Pile Weight	33oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	16+oz/square yard
ASTM D5848	Total Weight	56oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	3lbs/square foot
	SBR Rubber Infill Component	3lbs/square foot
	Total Product Weight	920oz/square yard

C. Carpet shall consist of monofilament fibers tufted into a primary backing with a secondary backing.

D. Carpet Rolls shall be 15' wide rolls.
   1. Rolls shall be long enough to go from field sideline to sideline.
   2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.

E. Backing:
   1. Primary backing to be comprised of two or more layers of polypropylene fabric.
   2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
   3. Perforated (with punched holes), backed carpet are acceptable.

F. Infill materials shall be approved by the manufacturer.
   1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR rubber crumb
   2. The sand component of the infill must represent 50% of the total infill, by weight.

G. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.

H. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.

Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

MATERIALS AND PRODUCTS – ALTERNATE

I. Artificial grass system materials shall consist of the following:
   1. Carpet made of monofilament polyethylene fibers tufted into a non-perforated porous backing.
   2. Infill: Graded sand and cryogenic rubber crumb that partially covers the carpet.
   3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass monofilament turf.

J. The installed artificial grass monofilament turf shall have the following properties:

Standard	Property	Specification
ASTM D1577	Fiber Denier	10,800
ASTM D3218	Tape Thickness	235 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/4"
ASTM D5848	Pile Weight	36oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	14+oz/square yard
ASTM D5848	Total Weight	57oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	6.2lbs/square foot
	SBR Rubber Infill Component	2.2lbs/square foot
	Total Product Weight	1267oz/sq. yard

K. Carpet shall consist of ridged monofilament fibers tufted into a primary backing with a secondary backing.

L. Carpet Rolls shall be 15' wide rolls.
   1. Rolls shall be long enough to go from field sideline to sideline.
   2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.

M. Backing:
   1. Primary backing to be comprised of two or more layers of polypropylene fabric.
   2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
   3. Perforated (with punched holes), backed carpet are unacceptable.

N. Infill materials shall be approved by the manufacturer.
   1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR cryogenic rubber crumb
   2. The sand component of the infill must represent 50% of the total infill, by weight.

O. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.

P. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.

Q. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

2.3 QUALITY CONTROL IN MANUFACTURING

A. The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of either is unacceptable.

B. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.

C. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

2.4 QUALITY CONTROL IN FIBER MANUFACTURING

Synthetic turf fiber must perform in a uniform manner or manufacturer quality control issues in the extrusion processes will be suspected. Linear Low Density Polyethylene Polymer ("LLDPE") and batch additives obtained from a reputable manufacturer are required to manufacture superior quality monofilament yarn. The master batch formula must include a UV stabilizer package added to its polymer base.

Adequate UV protection is essential to the long-term durability of any artificial grass fiber. Typically, stabilizer packages for polyethylene fibers have three components that protect the fibers from degradation: (1) primary antioxidants; (2) secondary antioxidants; and (3) UV stabilizers.

2.5 FIELD GROOMER & SWEEPER

D. Supply field groomer as part of the work.

1. Field Groomer shall include a towing attachment compatible with a field utility vehicle.
2. Field Groomer shall be a FieldTurf GroomRight
3. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.
4. Field Sweeper shall be a FieldTurf SweepRight

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that all sub-base leveling is complete prior to installation.

B. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
   1. Acceptance is dependent upon the Owner's test results indicating compaction and planarity are in compliance with manufacturer's specifications.
   2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.

C. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-½" from design grade.

D. Correct conditions detrimental to timely and proper completion of Work.

E. Do not proceed until unsatisfactory conditions are corrected.

F. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.

B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.

C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.

D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the half-diamond monofilament turf. A sub base that drains poorly is an unacceptable substrate

3.3 INSTALLATION - GENERAL

A. The installation shall be performed in full compliance with approved Shop Drawings.

B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.

C. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.

D. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

3.4 INSTALLATION

A. Install at location(s) indicated, to comply with final shop drawings, manufacturers'/installer's instructions.

B. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.

C. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
   1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer

D. Full width rolls shall be laid out across the field.
   1. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline.
   2. No cross seams will be allowed in the main playing area between the sidelines.
   3. Each roll shall be attached to the next roll utilizing standard state-of-the- art sewing procedures.
   4. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing surface.

E. Artificial turf panel seams shall be sewn. Other than extension inlays, seams secured by other means including gluing are unacceptable. Installation shall be 99% sewn.

1. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications.
2. Seams shall be flat, tight, and permanent with no separation or fraying.
3. In the case of all lines and logos, turf carpet must be sheared to the backing (do not cut the backing) and adhered using hot melt adhesives.

F. Infill Materials:
1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.
2. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of a base layer of sand followed by a final application of specifically sized rubber that completes the system. The Infill shall be installed to the depth of 1.5".

G. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers' recommendations. Number of applications will be dependent upon installation and field conditions.

H. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer's standard procedures.

I. Upon completion of installation, the finished field shall be inspected by the installation crew and an installation supervisor.

3.5 FIELD MARKINGS

A. Field markings shall be installed in accordance with approved shop drawings. If football is designated as the primary sport, all five yard lines will be tufted-in.

B. Balance of sports markings will be inlaid or painted in accordance with the Drawings.

C. Center field logo shall be either painted or inlaid according to artwork indicated on Drawings and in accordance with manufacturer's standard palette of turf colors.

D. End-zone letters and logos shall be either painted or inlaid according to artwork and fonts indicated on the Drawings, and in accordance with manufacturer's standard palette of turf colors.

3.6 ADJUSTMENT AND CLEANING

A. Do not permit traffic over unprotected surface.

B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.

C. All usable remnants of new material shall become the property of the Owner.

D. The Contractor shall keep the area clean throughout the project and clear of debris.

E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.7 PROTECTION

A. Protect installation throughout construction process until date of final completion.

END OF SECTION
32 18 16.16

SECTION 32 18 16.16

ARTIFICIAL GRASS – SLIT-FILM 2.25"

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all labor, materials, tools and equipment necessary to install slit-film artificial grass as indicated on the plans and as specified herein; including components and accessories required for a complete installation. Including but not limited to
   1. Acceptance of prepared sub-base.
   2. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.

1.2 SUBMITTALS

A. Substitutions: Other products are acceptable if in compliance with all requirements of these specifications. Submit alternate products to Architect for approval prior to bidding in accordance Section 01 25 13, Product Substitution Procedures.
   1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
   2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.

B. Comply with Section 01 33 00, Submittals Procedures. Submit for approval prior to fabrication.

C. Shop Drawings:
   1. Indicate field layout; field marking plan and details for the specified sports; i.e., NFHS Football; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
   2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
   3. Provide joint submission with related trades when requested by Architect.

D. Product Data:
   1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
   2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
   3. Submit data in sufficient detail to indicate compliance with the contract documents.
   4. Submit manufacturer's instructions for installation.

5. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.

E. Samples: Submit samples, 6 x 6 inches, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.

F. Product Certification:
   1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
   2. Submit test results indicating compliance with Reference Standards.

G. Project Record Documents: Record actual locations of seams, drains and other pertinent information in accordance with Specifications and General Requirements.

H. List of existing installations: Submit list including respective Owner's representative and telephone number.

I. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.

J. Testing data to the Owner to substantiate that the finished field meets the required shock attenuation, as per ASTM F1936.

K. Submit Bills of Lading/Material Delivery Receipts for synthetic turf infill materials. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.

L. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
   1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
   2. Primary & Secondary Backing Weights, ASTM D5848.
   3. Tuft Bind, ASTM D1335.
   4. Grab Tear Strength, ASTM D1682 or D5034.

1.3 QUALITY ASSURANCE

A. Comply with Section 01 43 00, Quality Assurance.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
   1. Shall be experienced in the manufacture and installation of slit-film grass turf for a minimum of three years. This includes use of a slit-film fiber, and the installation method.
   2. Shall have 100 fields in play for at least two years. Fields shall be 65,000 ft² or more
   3. Turf manufacturer shall have installed a minimum of 5 fields that are at least 8 years old, which is equal to the respective warranty period.

4. Shall have a minimum of five installations in the State of New Mexico.
5. Shall have a minimum of 100 installations in North America with a slit-film fiber, each field of 65,000 ft² or more.
6. Shall provide third party certification confirming minimum requirement for tuft bind.

C. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.
   1. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of specified slit-film material, including sewing seams and proper installation of the infill mixture.
   2. Installer shall be certified by the manufacturer and licensed.
   3. The installer supervisor shall have a minimum of 5 years of experience as either a construction manager or a supervisor of synthetic turf installations

D. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
   1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
   2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.

E. The Contractor shall verify special conditions required for the installation of the system.

F. The Contractor shall notify the Architect of any discrepancies.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01 60 00, Product Requirements.

B. Prevent contact with materials that may cause dysfunction.

C. Deliver and store components with labels intact and legible.

D. Store materials/components in a safe place, under cover, and elevated above grade.

E. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.

F. Inspect all delivered materials and products to ensure they are undamaged and in good condition.

1.5 SEQUENCING AND SCHEDULING

A. Coordinate the Work with installation of work of related trades as the Work proceeds.

B. Sequence the Work in order to prevent deterioration of installed system.

1.6 WARRANTY AND GUARANTEE

A. See Section 01780 - Closeout Submittals, For Additional Warranty Requirements.

B. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; prepaid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:

1. Pre-Paid 8-year insured warranty.
2. Insured Warranty Coverage must be provided in the form of 1 single policy
3. Maximum per claim coverage amount of at least $10,000,000.
4. Minimum of fifteen million dollar ($15,000,000) annual aggregate
5. Must cover full 100% replacement value of total square footage installed, minimum of $7.00 per sq. ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
6. Policies that include self-insurance or self-retention clauses shall not be considered.
7. Policy cannot include any form of deductible amount.
8. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.

C. The artificial grass system must maintain a G-max of less than 200 for the life of the Warranty as per ASTM F1936. Testing will be performed by a third party that specializes in this type of testing.

1.7 MAINTENANCE SERVICE

A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.

B. Manufacturer must provide maintenance guidelines to the facility maintenance staff.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. Approved manufacturers are as follows:

1. FieldTurf USA
175 N. Industrial Blvd
Calhoun, GA 30701
P: 303-775-6773

Model: XT-57 – with 3 lbs. rubber and 3 lbs. sand

2. ProGrass LLC
960 Penn Avenue, 8th Floor
Pittsburgh, PA 15222
P: 412-434-6003

Model: Infinity 45 – with 3 lbs. rubber and 3 lbs. sand

3. AstroTurf
2680 Abutment Road
Dalton, GA 30721
P: 800-723-8873

Model: XPE 42 – with 3 lbs. rubber and 3 lbs. sand

4. Alternate: FieldTurf Classic HD FTHD-57

2.2 MATERIALS AND PRODUCTS – Alternate One

A. Artificial grass system materials shall consist of the following:
1. Carpet made of slit-film polyethylene fibers tufted into a perforated backing.
2. Infill: Graded sand and rubber crumb that partially covers the carpet.
3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film turf.

B. The installed artificial grass slit-film turf shall have the following minimum properties:

Standard	Property	Specification
ASTM D1577	Fiber Denier	9,000+
ASTM D3218	Tape Thickness	100 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/8" - 3/4"
ASTM D5848	Pile Weight	33oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	16+oz/square yard
ASTM D5848	Total Weight	56oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	3lbs/square foot
	SBR Rubber Infill Component	3lbs/square foot
	Total Product Weight	920oz/square yard

C. Carpet shall consist of slit-film fibers tufted into a primary backing with a secondary backing.

D. Carpet Rolls shall be 15' wide rolls.
   1. Rolls shall be long enough to go from field sideline to sideline.
   2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.

E. Backing:
   1. Primary backing to be comprised of two or more layers of polypropylene fabric.
   2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
   3. Perforated (with punched holes), backed carpet are acceptable.

F. Infill materials shall be approved by the manufacturer.
   1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR rubber crumb
   2. The sand component of the infill must represent 50% of the total infill, by weight.

G. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.

H. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.

Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

MATERIALS AND PRODUCTS – Alternate Two

I. Artificial grass system materials shall consist of the following:
   1. Carpet made of slit-film polyethylene fibers tufted into a non-perforated porous backing.
   2. Infill: Graded sand and cryogenic rubber crumb that partially covers the carpet.
   3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film turf.

J. The installed artificial grass slit-film turf shall have the following properties:

Standard	Property	Specification
ASTM D1577	Fiber Denier	10,800
ASTM D3218	Tape Thickness	130 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/4"
ASTM D5848	Pile Weight	33oz/square yard
ASTM D5848	Primary Backing	7+oz/square yard
ASTM D5848	Secondary Backing	14+oz/square yard
ASTM D5848	Total Weight	54+oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	6.2lbs/square foot
	SBR Rubber Infill Component	2.2lbs/square foot
	Total Product Weight	1264oz/sq. yard

K. Carpet shall consist of slit-film fibers tufted into a primary backing with a secondary backing.

L. Carpet Rolls shall be 15' wide rolls.
   1. Rolls shall be long enough to go from field sideline to sideline.

2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.

M. Backing:
1. Primary backing to be comprised of two layers of polypropylene fabric.
2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
3. Perforated (with punched holes), backed carpet are unacceptable.

N. Infill materials shall be approved by the manufacturer.
1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR cryogenic rubber crumb
2. The sand component of the infill must represent 50% of the total infill, by weight.

O. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.

P. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.

Q. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

2.3 QUALITY CONTROL IN MANUFACTURING

A. The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of either is unacceptable.

B. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.

C. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

2.4 QUALITY CONTROL IN FIBER MANUFACTURING

Synthetic turf fiber must perform in a uniform manner or manufacturer quality control issues in the extrusion processes will be suspected. Linear Low Density Polyethylene Polymer ("LLDPE") and batch additives obtained from a reputable manufacturer are required to manufacture superior quality slit-film yarn. The master batch formula must include a UV stabilizer package added to its polymer base.

Adequate UV protection is essential to the long-term durability of any artificial grass fiber. Typically, stabilizer packages for polyethylene fibers have three components that protect the fibers from degradation: (1) primary antioxidants; (2) secondary antioxidants; and (3) UV stabilizers.

2.5 FIELD GROOMER & SWEEPER

D. Supply field groomer as part of the work.

1. Field Groomer shall include a towing attachment compatible with a field utility vehicle.
2. Field Groomer shall be a FieldTurf GroomRight
3. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.
4. Field Sweeper shall be a FieldTurf SweepRight

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that all sub-base leveling is complete prior to installation.

B. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.

1. Acceptance is dependent upon the Owner's test results indicating compaction and
planarity are in compliance with manufacturer's specifications.
2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.

C. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-½" from design grade.

D. Correct conditions detrimental to timely and proper completion of Work.

E. Do not proceed until unsatisfactory conditions are corrected.

F. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.

B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.

C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.

D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the slit-film turf. A sub base that drains poorly is an unacceptable substrate

3.3 INSTALLATION - GENERAL

A. The installation shall be performed in full compliance with approved Shop Drawings.

B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.

C. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.

D. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

3.4 INSTALLATION

A. Install at location(s) indicated, to comply with final shop drawings, manufacturers'/installer's instructions.

B. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.

C. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
   1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer

D. Full width rolls shall be laid out across the field.
   1. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline.
   2. No cross seams will be allowed in the main playing area between the sidelines.
   3. Each roll shall be attached to the next roll utilizing standard state-of-the- art sewing procedures.

4. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing surface.

E. Artificial turf panel seams shall be sewn. Other than extension inlays, seams secured by other means including gluing are unacceptable. Installation shall be 99% sewn.
   1. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications.
   2. Seams shall be flat, tight, and permanent with no separation or fraying.
   3. In the case of all lines and logos, turf carpet must be sheared to the backing (do not cut the backing) and adhered using hot melt adhesives.

F. Infill Materials:
   1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.
   2. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of a base layer of sand followed by a final application of specifically sized rubber that completes the system. The Infill shall be installed to the depth of 1.5".

G. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers' recommendations. Number of applications will be dependent upon installation and field conditions.

H. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer's standard procedures.

I. Upon completion of installation, the finished field shall be inspected by the installation crew and an installation supervisor.

3.5 FIELD MARKINGS

A. Field markings shall be installed in accordance with approved shop drawings. If football is designated as the primary sport, all five yard lines will be tufted-in.

B. Balance of sports markings will be inlaid or painted in accordance with the Drawings.

C. Center field logo shall be either painted or inlaid according to artwork indicated on Drawings and in accordance with manufacturer's standard palette of turf colors.

D. End-zone letters and logos shall be either painted or inlaid according to artwork and fonts indicated on the Drawings, and in accordance with manufacturer's standard palette of turf colors.

3.6 ADJUSTMENT AND CLEANING

A. Do not permit traffic over unprotected surface.

B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.

C. All usable remnants of new material shall become the property of the Owner.

D. The Contractor shall keep the area clean throughout the project and clear of debris.

E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.7 PROTECTION

A. Protect installation throughout construction process until date of final completion.

END OF SECTION
23.18.16.16

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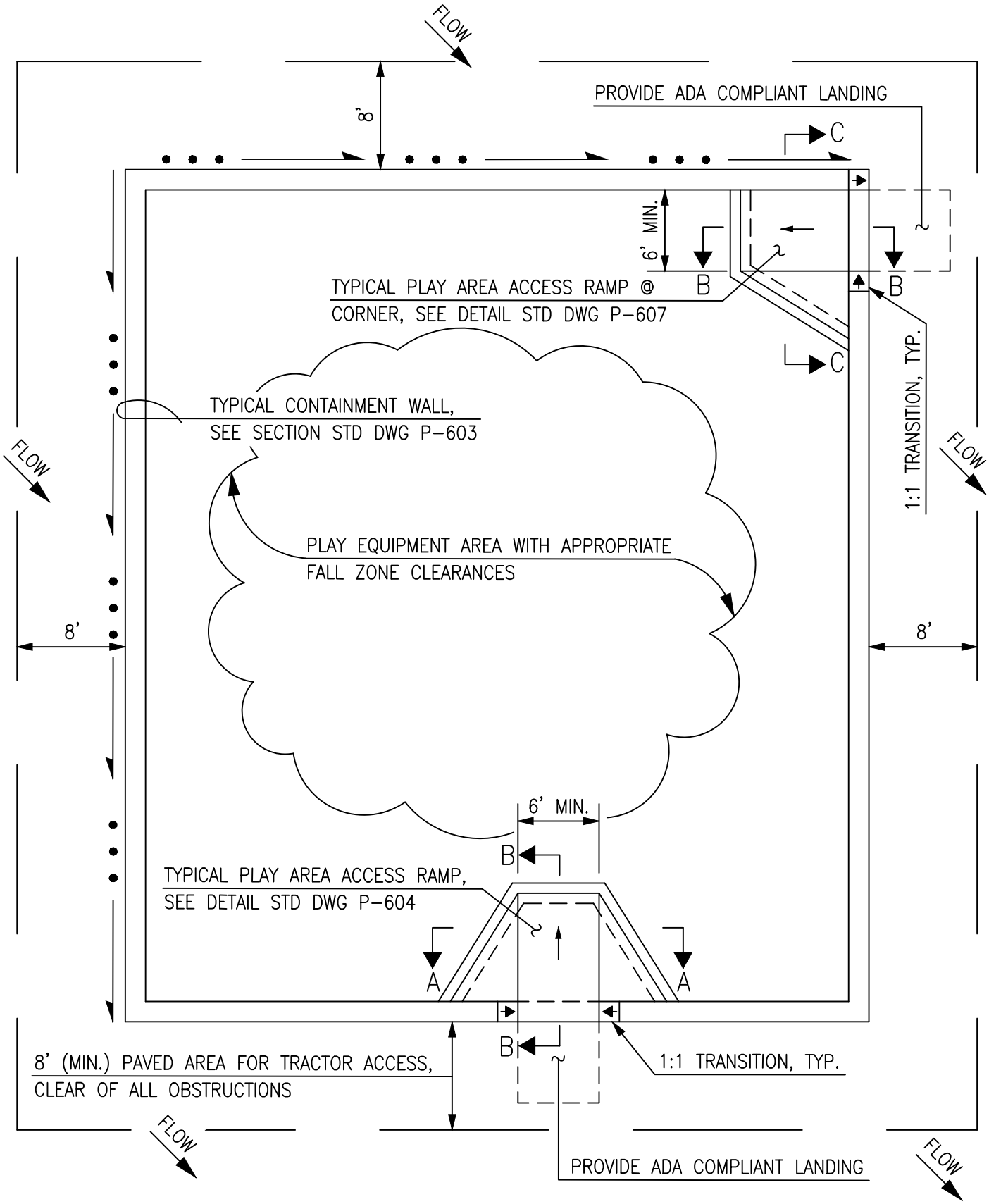
INDEX OF DRAWINGS

PAVING

STORM DRAINAGE



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TYPICAL PLAY AREA CONFIGURATIONS

DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	N.T.S.

STD DWG:

P-601

GENERAL NOTES:

1. ALL PLAY AREA CONSTRUCTION SHALL COMPLY WITH THE NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION – 1987, PUBLISHED BY THE NEW MEXICO CHAPTER AMERICAN PUBLIC WORKS ASSOCIATION. (REVISED 12/06)
2. REFER TO ALBUQUERQUE PUBLIC SCHOOL FACILITIES DESIGN & CONSTRUCTION DEPARTMENT FOR ADA PLAYGROUND EQUIPMENT GUIDELINES. IF A CONFLICT EXISTS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
3. COORDINATE PLAY AREA DIMENSIONS WITH PLAYGROUND EQUIPMENT MANUFACTURER TO ENSURE FALL ZONE CRITERIA IS MET.
4. PLAYGROUND EQUIPMENT SHALL BE PRIOR APPROVED BY APS PLAYGROUND EQUIPMENT OVERSIGHT.
5. EXISTING PLAYGROUND EQUIPMENT MUST BE AUDITED AND EVALUATED BY APS PLAYGROUND EQUIPMENT OVERSIGHT PRIOR TO DESIGN AND/OR CONSTRUCTION.
6. ALL MODIFICATIONS TO EXISTING PLAY AREAS MUST BE COORDINATED WITH AND OBTAIN PRIOR APPROVAL FROM APS PLAYGROUND EQUIPMENT OVERSIGHT.
7. ALL LANDINGS SHALL BE ADA COMPLIANT.
8. ALL SLOPES MUST BE ADA COMPLIANT.
9. ENGINEERED WOOD FIBER (EWF) FILL SHALL COMPLY WITH CURRENT ADA, ASTM AND CPSC RULES AND REQUIREMENTS.
10. SAND IS NOT AN ADA COMPLIANT PLAYGROUND SURFACE AND SHALL NOT BE USED IN CONJUNCTION WITH PLAYGROUND EQUIPMENT.
11. FALL ZONE CLEARANCE MUST BE CONSIDERED IN PLAY AREA DESIGN.
12. DRAINAGE SHALL BE DIRECTED AWAY FROM AND NOT INTO PLAY AREAS.
13. UNDERGROUND UTILITIES SHALL NOT BE INSTALLED BENEATH PLAY AREAS.
14. OVERHEAD UTILITIES SHOULD NOT BE LOCATED ABOVE PLAY AREAS. WHEN UNAVOIDABLE, CONSULT WITH APS PLAYGROUND EQUIPMENT OVERSIGHT.
15. PLAY AREA ACCESS OPENINGS SHALL BE 6 FEET MINIMUM WIDTH, EXCLUSIVE OF TRANSITIONS.
16. ACCESS OPENINGS SHALL HAVE 1:1 TRANSITIONS OUTSIDE OF THE 6 FEET MINIMUM WIDTH.

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PLAYGROUND GENERAL NOTES

DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	N/A

STD DWG:

P-602

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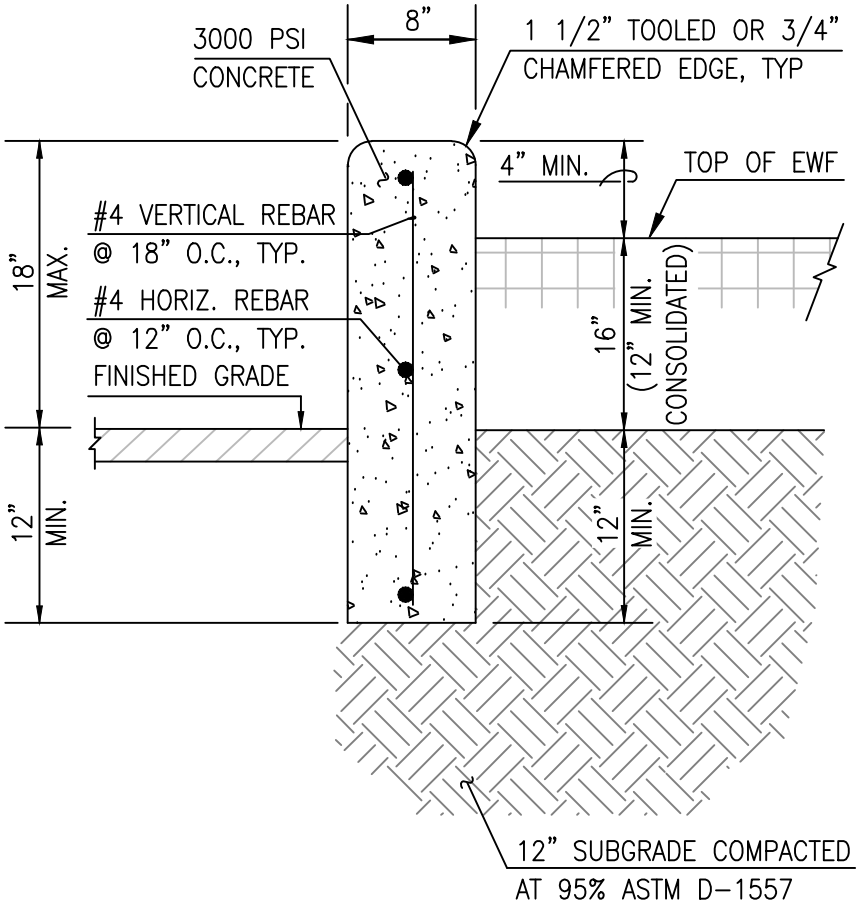
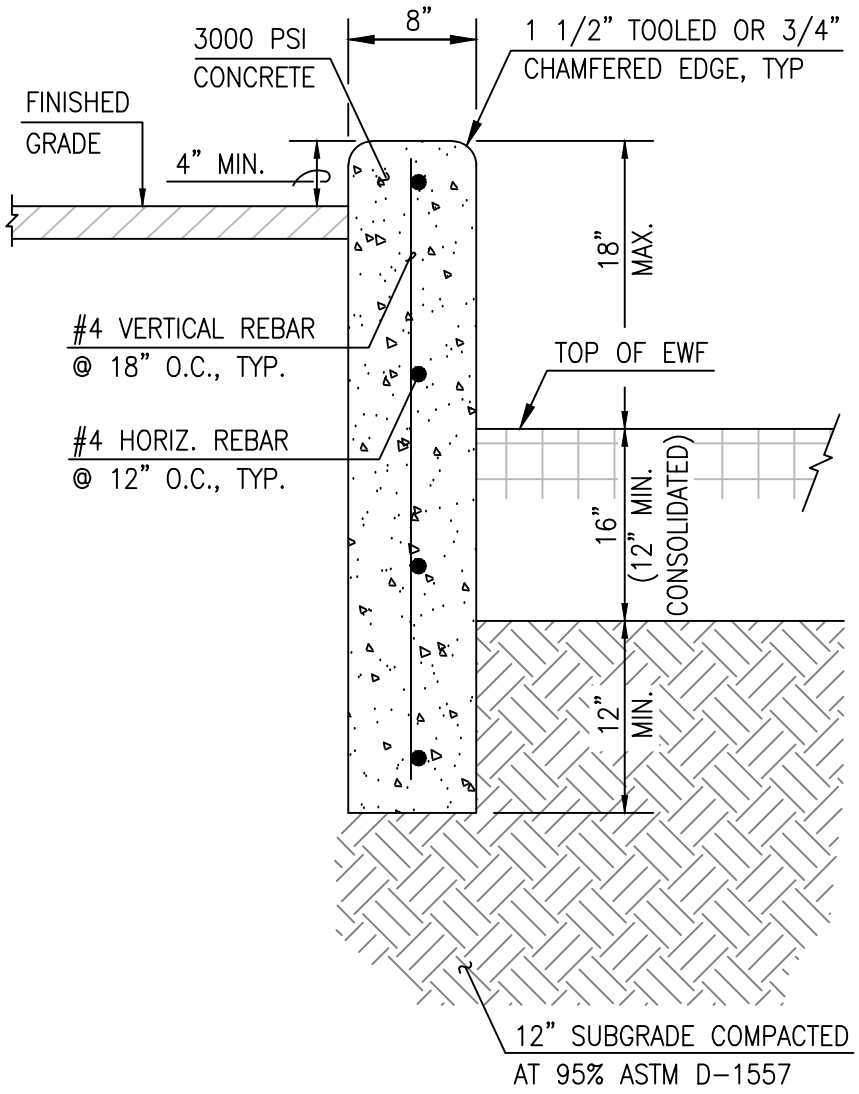
TYPICAL PLAY AREA CONTAINMENT WALL SECTIONS

DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	1" = 1'-0"
STD DWG:	P-603



1) FINISHED GRADE BELOW PLAY AREA



2) FINISHED GRADE ABOVE PLAY AREA

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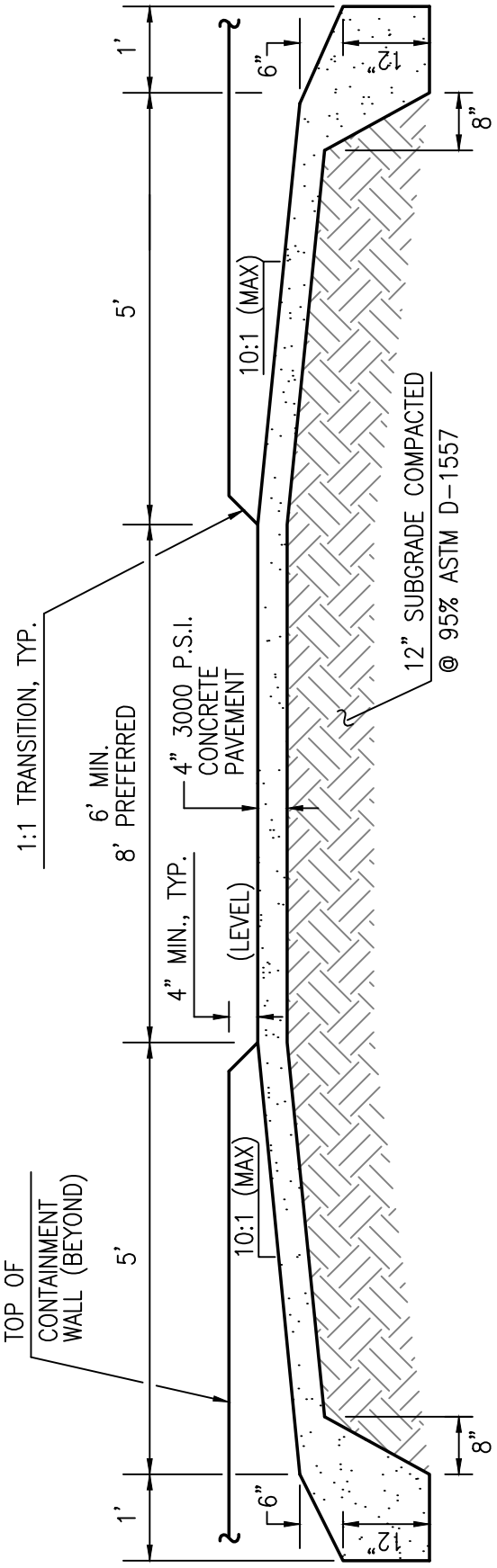
TYPICAL PLAY AREA ACCESS RAMP DETAIL

DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	1" = 2'-0"

STD DWG:

P-604



SECTION A-A

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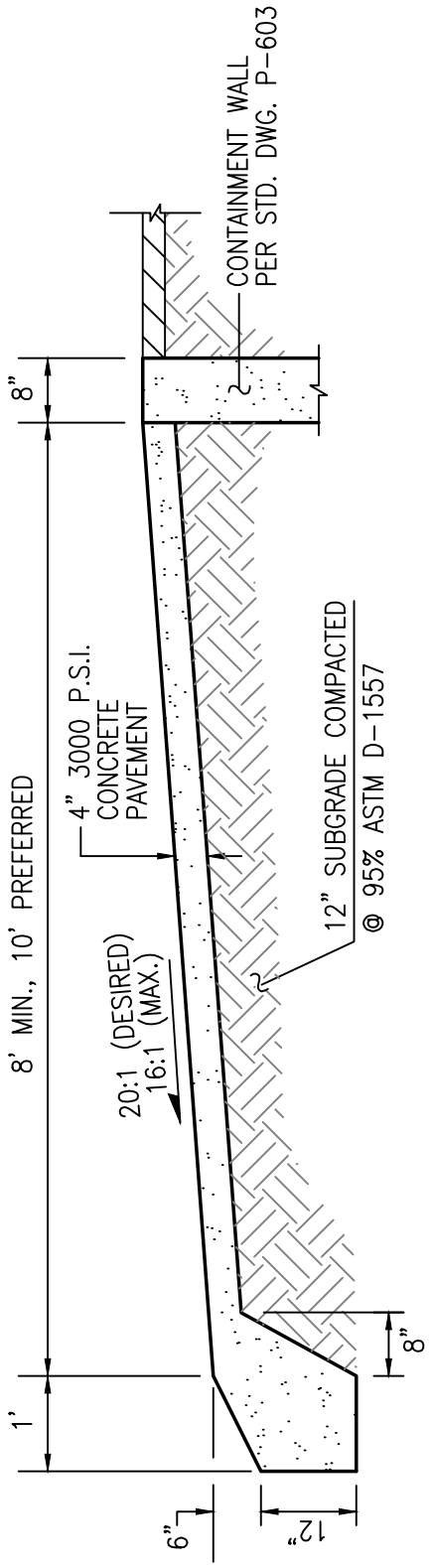
TYPICAL PLAY AREA ACCESS RAMP SECTION A-A

DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	1" = 2'-0"

STD DWG:

P-605



SECTION B-B

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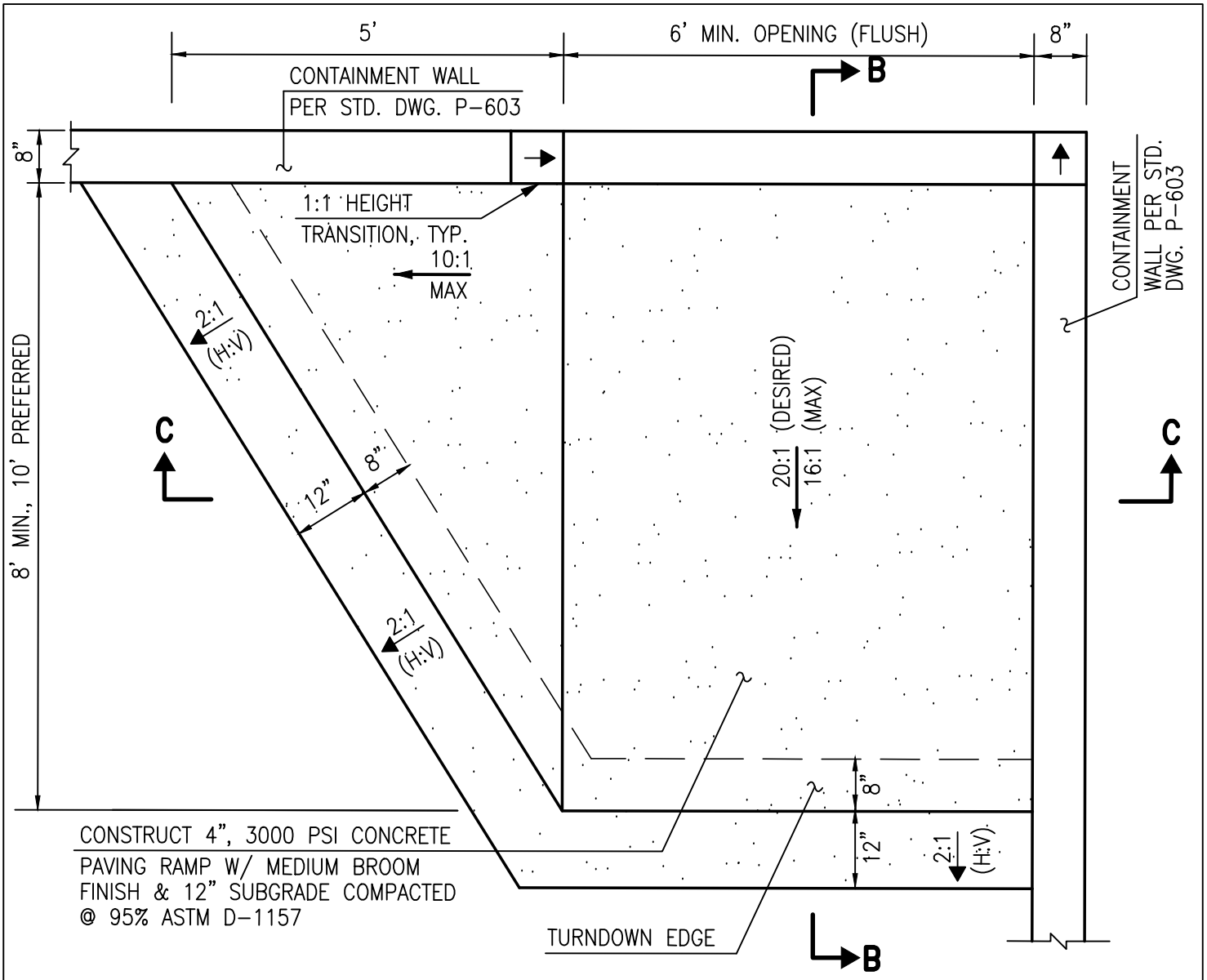
TYPICAL PLAY AREA ACCESS RAMP SECTION B-B

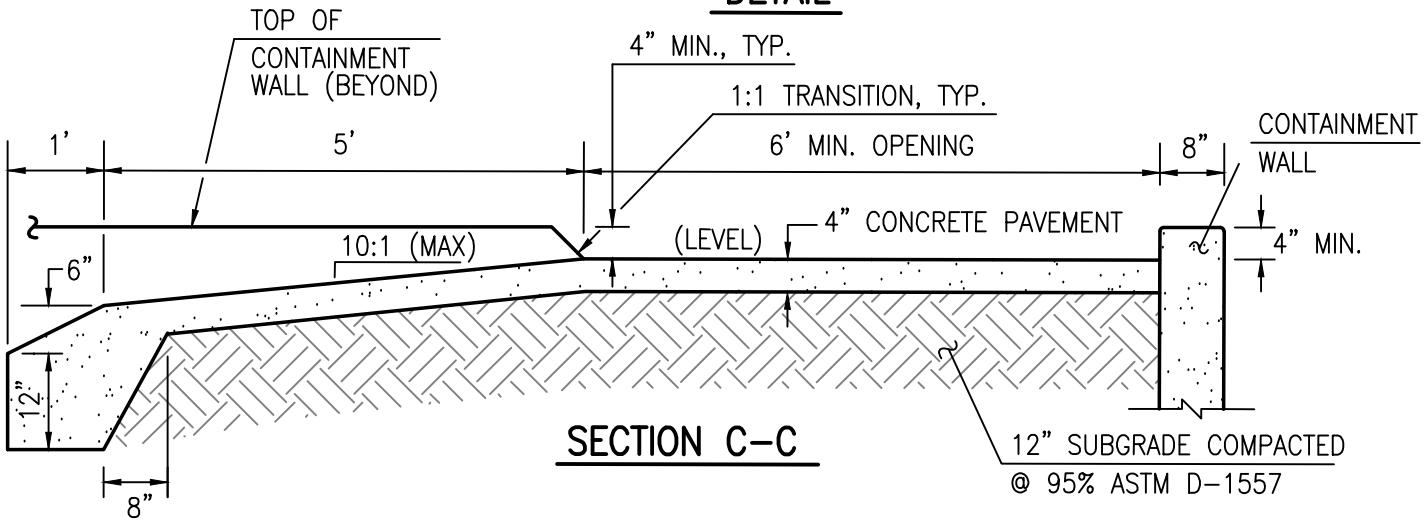
DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	1" = 2'-0"

STD DWG:

P-606



DETAIL



SECTION C-C

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TYPICAL PLAY AREA ACCESS RAMP @ CORNER DETAIL

DRAWN BY:	HMCG
REVIEWED BY:	APS
DATE ISSUED:	10/31/16
SCALE:	1" = 2'-0"

STD DWG:

P-607