SECTION 32 18 00

ATHLETIC AND RECREATIONAL SURFACING

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\*\* NOTE TO SPECIFIER \*\* Robertson Recreational Surfaces; Recreational Safety Surfacing.  
This section is based on the products of Robertson Recreational Surfaces, which is located at:2140 E. Cedar St.Tempe, AZ 85281Toll Free Tel: 800-858-0519Tel: 602-340-8873Fax: 602-340-0402Email: [request info (info@totturf.com)](https://arcat.com/rfi?action=email&company=Robertson%252BRecreational%252BSurfaces&message=RE%253A%2520Spec%2520Question%2520(02790rob)%253A%2520&coid=42699&spec=02790rob&rep=&fax=602-340-0402)  
Web: <https://www.robertsonsurfaces.com>   
 [ [Click Here](https://arcat.com/company/robertson-recreational-surfaces-42699) ] for additional information.  
We are the only official installers of TotTurf - America's Favorite Playground Surface! Robertson now installs nationwide with our sister company Sport Surface Specialties. Robertson Recreational Surfaces offers the full spectrum of compliant recreational surfacing for parks, schools, daycare, neighborhoods, and more. Whether you are creating a brand new space or rejuvenating an older playground, we are here to support. Our commitment to our customers is that our products and services will meet or exceed ASTM and IPEMA certifications for safer recreational surfaces. Our team believes in providing safer recreation through beyond compliant installations. We strive to make recreation accessible to all people with any ability through resilient surfaces that allow for safer activity for anyone.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Playground Resilient Surfacing:
       1. Poured in place resilient surfacing (EPDM) (TPV) (TPV SUPREME).
       2. Poured in place non-porous safety surfacing. (Splash Tread)
       3. Poured in place non-porous safety surfacing. (Splash Tread Supreme)
       4. Resilient, interlocking, playground safety surfacing tiles.
       5. Synthetic turf. (Pup Turf)
       6. Synthetic turf (Pro Play) (Pro Play Plus) (Pro Play Elite)
       7. Poured in place resilient surfacing. (TotTurf PIP Bonded Rubber) (TotTurf PIP 5/500) (TotTurf PIP 1.5 Inch Renew) (TotTurf PIP Refresh and Patching Repairs)
       8. Poured in place pedestrian traffic surfacing. (TOTTURF Trails)
    2. Heavy duty wear mat.
    3. Recycled shredded rubber surfacing.
    4. Engineered wood fiber.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 32 12 16 - Asphalt Paving.
    2. Section 03 30 00 - Cast-in-Place Concrete.
    3. Section 11 68 13 - Playground Equipment: Playground layout (staking).
    4. Section 31 00 00 - Earthwork: grading, subgrade preparation.
    5. Section 32 11 23 - Aggregate Base Courses: Subbase for resilient surfacing.
    6. Section 32 33 00 -Site Furnishings.
    7. Section 32 13 13 - Concrete Paving: Concrete header.
    8. Section 33 42 11 - Stormwater Gravity Piping.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
       1. ASTM C 1026 - Standard Test Method for Measuring the Resistance to Freeze-Thaw Cycling.
       2. ASTM D412 - Standard test methods for vulcanized rubber and thermoplastic rubbers and thermoplastic elastomers-tension.
       3. ASTM D418 - Standard Test Method for Testing Pile Yarn Floor Covering Construction.
       4. ASTM D573 - Standard Test Method for Rubber-Deterioration in an Air Oven (Heat Aged).
       5. ASTM D624 - Standard test method for tear strength of conventional vulcanized rubber and thermoplastic elastomers.
       6. ASTM D1171-99(07)
       7. ASTM D1577 - Standard Test Method for Linear Density of Textile Fiber.
       8. ASTM D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings.
       9. ASTM D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics.
       10. ASTM D2047- Standard test method for determining the static coefficient of friction of ceramic tile and other like surfaces by the horizontal dynamometer pull meter method. This standard replaces ASTM C1028.
       11. ASTM D2859 - Standard test method for flammability of finished textile floorcovering materials.
       12. ASTM D3389 - Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Double-Head Method).
       13. ASTM D3676 - Standard Specification for Rubber Cellular Cushion Used for Carpet or Rug Underlay.
       14. ASTM D4060 Taber Abrasion.
       15. ASTM D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test).
       16. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
       17. ASTM D1577 - Standard Test Method for Linear Density of Textile Fiber.
       18. ASTM D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering.
       19. ASTM E303 - Standard test method for measuring surfacing frictional properties using the British Pendulum tester.
       20. ASTM E 648-10 - Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
       21. ASTM F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
       22. ASTM F1292-18 - Standard specification for impact attenuation of surface systems under and around playground equipment.
       23. ASTM F 1551-03 - Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials: Suffix-DIN 18-035, Part 6: Water Permeability of Synthetic Turf Systems and Permeable Bases.
       24. ASTM F1951 - Standard specification for determination of accessibility of surface systems under and around playground equipment.
       25. ASTM F2479-12 Standard Specification for Purchase, Installation and Maintenance.
       26. ASTM F3012 - Standard Specification for Loose-Fill Rubber for Use as a Playground Safety Surface under and around Playground Equipment.
       27. ASTM G21-15 Fungi Test.
    2. IPEMA Certified. The manufacturer must provide proof of certification. In the interest of public playground safety, IPEMA provides an independent laboratory which validates a manufacturer's certification on conformance to ASTM F1292.
    3. STC Suggested Guidelines for the Essential Elements of Synthetic Turf Systems.
    4. Maricopa County Chemical Leaching Test.
  1. DEFINITIONS
     1. EPDM Granules: Ethylene propylene diene monomer or EPDM rubber, M-class, a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM D1418; the M class includes rubbers having a saturated chain of the polyethylene type.
     2. Critical Fall Height: A critical fall height, CFH, is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.
     3. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
     4. TPV: Thermoplastic vulcanized elastomer, developed using resin and synthetic rubber with higher UV stabilization.
     5. SBR: Styrene-butadiene or styrene-butadiene rubber describes families of synthetic rubbers derived from styrene and butadiene.
  2. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. 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.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
    2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
     2. Poured in place surfaces shall be manufactured and installed by trained, experienced company employees or certified installers who have successfully completed the "Certified Installers Training Program" required by Robertson Industries Inc.
     3. Testing: Critical Fall Height Four feet through 10 feet have been tested in accordance with Section 15 - Critical Fall Height Test Procedure of ASTM F1292-18.
     4. Installer's Qualifications: Interlocking tiles. Installers must have successful experience in installation of playground safety surfacing tiles of similar type to that specified, with a minimum of 20 projects completed within the last 5 years.
        1. Employ persons trained for installation of playground safety surfacing tiles and are approved by manufacturer.
     5. Applicator Qualifications: Company specializing in performing the work of this section.
        1. Minimum five years of documented experience.
        2. Approved by manufacturer.
     6. Synthetic Turf:
        1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
           1. Must be experienced in the manufacturing of tall pile synthetic infill grass systems with the same fiber as specified.
           2. Must be a member in good standing with the STC.
           3. Must utilize best practices as certified by ISO-9001 and ISO-14001.
           4. Must be owned and operated in the U.S.A.
           5. Must have no periods of insolvency over the last 25 years.
        2. Installer Qualifications: Company specializing in performing the work of this section.
           1. The Synthetic Turf Installer must provide competent workmen skilled in this type of synthetic grass installation. All technicians must have installed similar synthetic turf.
           2. The Owner has conducted an extensive review of synthetic turf products, including visiting installed sites and review of other agencies' review criteria. Based upon their research, they have established the following criteria for acceptance of a synthetic turf product. No variation from these criteria shall be allowed. The Owner's review is considered final.
           3. The Synthetic Turf Installer shall have minimum experience of at least 5 years, actively selling, installing, and maintaining in-fill synthetic turf project of similar size.
           4. The Synthetic Turf Installer must provide a list of references based on previous installations.
           5. The Installation team shall be established, insured installation firm experienced as a premium turf installer with suitable equipment and supervisory personnel, with a minimum of 5 years' experience with 15 foot (4.572 m) wide tufted materials.
     7. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
       1. The intent of mock-up is to demonstrate quality of workmanship and visual appearance.
       2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
       3. Retain mock-up during construction as a standard for comparison with completed work.
       4. Do not alter or remove mock-up until work is completed or removal is authorized.
  1. PRE-INSTALLATION CONFERENCE
     1. 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.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Materials and equipment shall be delivered and stored in accordance with the manufacturer's recommendations.
        1. Store off the ground and covered; handle and protect products from moisture in accordance with manufacturer's instructions.
        2. Deliver materials in manufacturer's unopened containers, fully identified with brand, type, and all other qualifying information.
           1. Material Safety Data Sheets for each product.
        3. Take necessary precautions to keep products clean, dry, and free of damage.
     2. Interlocking Tiles:
        1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
        2. Storage: In accordance with manufacturer's instructions.
           1. Playground Safety Surfacing Tiles:

Store tiles in a dry area prior to installation.

Protect tiles from direct sunlight before installation.

* + - * 1. Adhesive: Store in dry area at minimum temperature of 40 degrees F (4 degrees C).
      1. Handling: Protect materials during handling and installation to prevent damage.
  1. PROJECT SITE CONDITIONS
     1. Poured in Place surfacing: To be installed on a dry sub-surface, with no prospect of rain within the initial drying period, and within the recommend temperature range of the manufacturer.
        1. Installation Ambient Temperature Range: Greater than 40 degrees F (4 degrees C) and less than 120 degrees F (49 degrees C).
           1. Installation below or above this range and/or high humidity may affect cure time, and the structural integrity of the final product.
        2. Immediate surrounding sites must be reasonably free of dust conditions, or this could affect the final surface look.
     2. Non-porous poured in place safety surfacing.
        1. Installation Ambient Temperature Range: Greater than 40 degrees F (4 degrees C) and less than 120 degrees F (49 degrees C).
        2. Installation Substrate Temperatures: Greater than 40 degrees F (4 degrees C) and less than 120 degrees F (49 degrees C).
           1. Do not apply if the substrate temperature is below or above this range.
        3. Do not apply if precipitation is expected within a twenty-four (24) hour period.
        4. Surface Preparation: Surface may consist of:
           1. Concrete: Shot blast, High pressure washing, Scarifying as needed for proper adhesion low-med broom finish.
           2. For attenuated requirements: Attenuated cushion layer with minimum 1/2 inch (13 mm) SBR, EPDM or TPV cap. Attenuated system must allow proper relief to connecting sidewalks for 1/2 inch (13 mm) Splash Tread or 3/16 inches (5 mm) Splash Tread Supreme installation.
           3. Adheres to properly prepared concrete, asphalt, wood, patterned metal, plaster, rock / pebble surfaces, brick, existing or new attenuated poured in place surfaces, most epoxy surfaces, and acrylic surfaces.
           4. Manufacturer approved surface preparation Drain/nozzle locations:

Drain to be in the range of 3/16 (5 mm) Splash Tread Supreme to 1/2 inch (13 mm) Splash Tread higher than surrounding surface dependent on product line as recommended by manufacturer.

Recessed or flush drain and obstructions: Grind 1/4 inch (6 mm) deep by 2 inches (51 mm) wide keyway around drain/nozzle or obstruction. Splash Tread Supreme liquid to fill keyway and be level to drain/nozzle.

* + 1. Interlocking Tiles:
       1. Ideal Atmospheric Temperature: Above 40 degrees F (4 degrees C). Rising Atmospheric temperatures should be above 40 degrees F (4 degrees C) for 24 hours and preferably climbing.
       2. Tile installation is not recommended when temperatures are expected to remain below 45 degrees F (7 degrees C) for an extended period.
       3. Tile or Air Temperatures: Consult manufacturer's installation instructions for modified installation procedure when tile or air temperatures are above 85 degrees F (29 degrees C).
    2. Synthetic Turf:
       1. Coordinate all work with the work of other sections to avoid delay and interference with other work.
       2. Protect excavations by shoring, bracing sheeting, underpinning, or other methods as required to prevent cave-ins or loose dirt from entering excavations. Barricade open excavations and post warning lights at work adjacent to public streets and walks.
  1. WARRANTY
     1. Poured in Place surface shall maintain required impact attenuation characteristics and be guaranteed against defects in workmanship and material for a limited five-year period or as specified and agreed upon per alternate contract. The warranty will be specific to maintenance requirements and performance standards of the completed product. Warranty is void if not installed by Manufacturers Trained and Certified Poured in Place Surfacing Installers.
     2. Materials and Workmanship: Playground safety surfacing tiles shall be warranted for defects in materials and workmanship for 10 years from the date of Final Acceptance (i.e. Notice of Completion).
     3. Synthetic Turf: The Contractor shall provide a minimum eight (8) year warranty policy by the manufacturer against defects in workmanship of synthetic turf from shipment date. Installations are warranted for one (1) year from the installation date against defects in attenuation layer (if applicable) and seams if maintenance is not performed. Other defects not warranted shall include, but not be limited to ultraviolet ray fading, degradation, or excessive wear of fiber.
        1. The warranty shall be for full replacement of any damaged product within the warranty period. The warranty shall be comprehensive and sufficient to replace all turf if necessary.
        2. The warranty shall be effective from the date of substantial completion.
        3. The Warranty shall contain no usage limits for warranted turf.
     4. Poured in Place Surface: TOTTURF TRAILS recreational surfacing system.
        1. Manufacturer Warranty to Owner that covers defects in materials and workmanship of the rubber for a period of Four (4) years from the date of Substantial Completion. Warranty requires system installation by Robertson Recreational Surfaces trained employees.
        2. All warranties, expressed or implied, are contingent upon the following:
           1. installation being performed by Robertson Recreational Surfaces.
           2. The Owner, at owner's expense, having a Topcoat performed at Two (2) year intervals from date of substantial completion, and full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
        3. The manufacturer's warranty should include general wear and tear. The warranty should specifically exclude vandalism, equipment or vehicle damage, high heel punctures, acts of war or acts of nature beyond the control of the owner or the manufacturer. All poured in place warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
        4. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the TOTTURF TRAILS recreational surface.
     5. Poured in Place SPLASH TREAD: The bidder or poured in place safety surfacing manufacturer must provide the following:
        1. Manufacturer Warranty to Owner: Cover defects in materials and workmanship.
           1. Rubber: For four (4) years from the date of Substantial Completion.
           2. Colorseal or Clearseal: For One (1) year.
           3. Include general wear and tear.
           4. Specifically exclude vandalism, high heel punctures, hard water/chemical stains, acts of war or acts of nature beyond the control of the owner or the manufacturer.
        2. The bidder should provide a warranty to the owner that covers defects in the installation workmanship, and further warrants the installation was done in accordance with the manufacturer's recommendations.
        3. All poured in place warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
        4. The owner also agrees to do routine maintenance as outlined in the Robertson Recreational Surfaces Maintenance manual.
        5. The installer should clean the jobsite of excess materials and if necessary, backfill any excavation around the perimeter with earth or appropriate fill material.
        6. The manufacturer should instruct the owner's personnel on proper maintenance of the SPLASH TREAD Surfacing safety surface.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Robertson Recreational Surfaces, which is located at:2140 E. Cedar St.Tempe, AZ 85281Toll Free Tel: 800-858-0519Tel: 602-340-8873Fax: 602-340-0402Email: [request info (info@totturf.com)](https://arcat.com/rfi?action=email&company=Robertson%252BRecreational%252BSurfaces&message=RE%253A%2520Spec%2520Question%2520(02790rob)%253A%2520&coid=42699&spec=02790rob&rep=&fax=602-340-0402);Web: <https://www.robertsonsurfaces.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. PLAYGROUND RESILIENT SURFACING, POURED IN PLACE
     1. Product Scope: EPDM.
        1. Poured in Place Surface: Recycled rubber mixed with a polyurethane binder, then capped with EPDM granules mixed with aliphatic or aromatic binder.
        2. Surfaces shall comply with ADA and CPSC guidelines as well as ASTM Standards. The manufacturer is to be certified by IPEMA, a third-party testing organization for playground surfaces and equipment.
     2. Product Scope: TPV.
        1. Poured in Place Surface: Recycled rubber mixed with a polyurethane binder, then capped with TPV granules mixed with aliphatic binder.
        2. Surfaces shall comply with ADA and CPSC guidelines as well as ASTM Standards. The manufacturer is to be certified by IPEMA, a third-party testing organization for playground surfaces and equipment.
     3. Product Scope: TPV SUPREME.
        1. Poured in Place Surface: Recycled rubber mixed with a polyurethane binder, then capped with 0.02 to 0.06 inches (0.5 to 1.5 mm) TPV granules mixed with aliphatic binder.
        2. Surfaces shall comply with ADA and CPSC guidelines as well as ASTM Standards. The manufacturer is to be certified by IPEMA, a third-party testing organization for playground surfaces and equipment.
     4. Performance Requirements:
        1. Area Safety: Poured in place within playground use zones shall meet or exceed the performance requirements of the CPSC, ADA, and Fall Height Test ASTM F1292-18.
           1. Surface: To yield a peak deceleration of 200 G-max and peak Head Injury Criteria (HIC) value of 1,000 for head-first fall from highest accessible portion of play equipment installed, as shown on Drawings.
           2. IPEMA certification is required.
           3. ASTM F1292-18, section 15, the laboratory test used to determine critical fall height must be conducted on surfacing material samples identical in design, materials, components, and thickness and manufactured as the installed playground surface.
        2. Accessibility: Children's outdoor play areas must be in compliance with the Uniform Federal Accessibility Standards (UFAS) FED-STD-795 and the Architectural and Engineer Instructions (9AEI) Design Criteria.
        3. Americans with Disabilities Act Requirements. Accessibility Guidelines(ADAAG) 28 CFR Part 36 that provide equal or greater accessibility than the requirements of UFAS must also be met in children's outdoor play areas.
        4. Poured in place surfaces intended to serve as accessible paths of travel for persons with disabilities shall be firm, stable and slip resistant, and meet the requirements of ASTM F 1951-14 and ASTM F1292-18.
     5. Wear Course: Ethylene Propylene Diene Monomer (EPDM) granules with polyurethane binder formulated to produce an even, uniform, seamless surface unless otherwise agreed upon by owner.
        1. EPDM: Peroxide cured. EPDM Content: 26 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
        2. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
        3. EPDM Granules: 0.04 to 0.16 inches (1 to 4 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
        4. Wear Couse Thickness: Minimum 0.5 inch (13 mm).
        5. Wear course is to be porous.
        6. Manufacturers: Gezolan, Sparton Enterprises LLC.
     6. Wear Course:
        1. TPV Granules: Thermal Plastic Vulcanized (TPV) granules with polyurethane binder formulated to produce even, uniform, uniform, seamless surface unless otherwise agreed upon by owner.
        2. TPV Granules: Thermal Plastic Vulcanized (TPV) granules 0.04 to 0.16 inches (1 to 4 mm) or 0.02 to 0.06 inches (0.5 to 1.5 mm) diameter with polyurethane binder formulated to produce even, uniform, uniform, seamless surface unless otherwise agreed upon by owner.
        3. TPV: Peroxide cured. TPV Content: 26 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
        4. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
        5. TPV Granules: 0.04 to 0.16 inches (1 to 4 mm) or 0.02 to 0.20 inches (0.5 to 5 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
        6. TPV Granules: 0.02 to 0.20 inches (0.5 to 5 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
        7. Wear Couse Thickness: Minimum 0.5 inch (13 mm).
        8. Wear course is to be porous.
        9. Manufacturers: Rosehill Polymers.
     7. Attenuation Cushion Layer: Recycled styrene butadiene rubber (SBR) and/or cryogenic crumb rubber and/or pre consumer postindustrial reclaimed scrap rubber adhered with a 100 percent solids polyurethane binder to form a resilient porous material.
        1. Strands of SBR: From 0.02 to 0.08 inches (0.5 to 2.0 mm) in thickness by 0.12 to 0.79 inches (3.0 to 20 mm) in length.
        2. Chunk Premium Black Rubber Granules: Pre-consumer, post-industrial, reclaimed rubber, granulated through a 5/8 inch (16 mm) screen containing less than 2 percent dust.
        3. Chunk Premium Black Rubber Granules:
           1. Manufacturer: American Recycling Center, Inc.

Phone: (989) 725-5100

Address: 655 Wabassee Drive, Owosso, MI 48867

* + - 1. SBR Crumb Rubber (5 to 9 Mesh) using sieve analysis ASTM D5644 with a fiber content of 0.1 percent or less.
      2. Binder: 5 to 12 percent of total material weight, providing 100 percent particle coating.
      3. Compatible with wear course and must meet requirements for impact attenuation.
      4. Manufacturer: Robertson Industries Inc., Sparton Enterprises LLC
    1. Binder:
       1. No Toluene Diphenyl Isocyanate (TDI) will be used.
       2. No filler materials to be used in urethane such as plasticizers.
       3. Catalyzing Agent: Must contain no heavy metals.
       4. Weight of polyurethane: 8.5 to 9.5 lbs per gal (1.02 to 1.14 kg per L).
       5. Manufacturer may modify the urethane type to match extreme weather conditions. Substitutions must equal or exceed original quality.
       6. Binder: Aromatic VORAMER MR Products. Manufacturer: DOW Chemical.
       7. Binder: Aromatic Urethane Stobielast S 1020. Manufacturer: Stockmeier Urethanes, USA, Inc.
       8. Binder: Aliphatic Urethane Premium, Non-Ambering. Manufacturer: Accella Polyurethane Systems.
    2. Tot Turf Advantage inserts: Thermal Plastic Vulcanized angular granules.
       1. Shore A hardness: 60 to 70 A. Particle Size: 0.02 to 0.06 inches (0.5 to 1.5 mm).
       2. Insert Thickness: 0.5 inch (13 mm).
       3. Insert to be porous.
       4. Aromatic or aliphatic urethane to be used as a binder.
       5. Location: Install under swings, swing bays, and slide exits, unless otherwise noted in Drawings. Customer to approve location of wear mat inserts.
       6. Standard Color: Terra Cotta Red 0.02 to 0.06 inches (0.5 to 1.5 mm).
       7. Standard Color: Blue 0.02 to 0.06 inches (0.5 to 1.5 mm).
       8. Standard Color: Green 0.02 to 0.06 inches (0.5 to 1.5 mm).
       9. Standard Color: Beige 0.02 to 0.06 inches (0.5 to 1.5 mm).
       10. Size: Swing bay use locations are to have TPV Inserts inclusive of all outside bay structure poles. Singular swings and slide exits shall be 48 x 48 x 0.5 inches (1219 x 1219 x 13 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. POURED IN PLACE NON-POROUS SAFETY SURFACING (SPLASH TREAD)
     1. Basis of Design: SPLASH TREAD poured in place safety surfacing system as manufactured by Robertson. A dual durometer poured in place system with a grouted and sealed wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be non-porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
     2. Primer: From Robertson Recreational Surfaces. A 100 percent solids urethane primer/sealer designed with low viscosity and penetrating abilities.

\*\* NOTE TO SPECIFIER \*\* Delete if cushion layer is not required.

* + 1. Cushion Layer: Mixture of black recycled SBR rubber buffings mixed with a 100 percent solids moisture cured MDI Polyurethane binder; 100 lbs (45.4 kg) of SBR rubber buffings to 12 lbs (5.44 kg) of binder, installed at the appropriate thickness. As an upgrade, a 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available. The cushion layer should be porous.
    2. SPLASH TREADSURFACING: Wearing surface manufactured from TPV or EPDM virgin colored rubber granules mixed with an aromatic or aliphatic urethane binder. 110 lbs (49.9 kg) of TPV to 22 lbs (10 kg) of binder.
    3. FLEXGROUT: A thixotripic thermoplastic composite grout applied at 1 gallon per 35 sq ft over wear course layer rendering it non porous. Tested by QAI Laboratories for the following:
       1. Coefficient of Friction per ASTM D2047-11: Polish Flooring Surface. Report No. QI1411123-4. Dry: 0.588. Wet: 0.817.
       2. ASTM D4 12-06ae2 ThermoPlastic Elastomers - Tension. Report No. QI1305148-2.
          1. Peak Tensile Strength: 163 psi (1123.8 kPa) and chlorine soaked at 133 psi (917 kPa).
          2. Tensile Elongation at Break: 132.2 percent and chlorine soaked at 112.2 percent.
       3. ATSM D624-00(2012) Tear Strength. (Test report No. QI1305148-2) FLEXGROUT.
          1. Median Maximum Tear Strength: 75.74 lbs (336.9 N) and chlorine soaked at 70.03 lbs (311.5 N).
    4. Flex Color Seal: Water-based composite color seal applied at 200 sq ft per gal (4.9 sq m per L) and spread evenly to cover entire surface.
       1. Cure Time: 24 to 72 hours.
       2. Color: As selected from Manufacturer's Color Chart by owner.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. POURED IN PLACE NON-POROUS SAFETY SURFACING (SPLASH TREAD SUPREME)
     1. Basis of Design: SPLASH TREAD SUPREME safety surfacing system as manufactured by Robertson Recreational Surfaces. A super bonding, flexible synthetic resin modified rubber solid membrane coating which forms a durable, anti-skid, weather, and chemical resistant surface over properly prepared substrates. It can be applied to, but is not limited to, shower and restrooms, pool decks, pool interiors, splash pads, locker rooms, and most properly prepared surfaces.
        1. Part A: Liquid Polymer.
        2. Part B: Catalyst.
        3. Part C: Poly Dust.
        4. Broadcast: Thermoplastic Vulcanizate Rubber Granules (TPV): 0.02 to 0.06 inches (0.5 to 1.5 mm).
        5. Color: As selected by the Architect.
        6. Sealer: Clear. Chlorine and UV resistant.
        7. Performance Requirements: Product to meets or exceed ASTM standards below.
           1. ASTM G21-15 Fungi Test.
           2. AS/NZS 4586 Pendulum Test (Slip Resistance).
           3. ASTM D4060 Taber Abrasion.
           4. ASTM D1171-99(07).
           5. ASTM D2859 Fire Resistance Test.
           6. Maricopa County Chemical Leaching Test.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. PLAYGROUND RESILIENT SURFACING, INTERLOCKING TILES
     1. Performance Requirements: Testing results.
        1. Freeze Thaw, ASTM C1026: no appearance of the presence of cracking, chipping, or breaking of the tile.
        2. Rubber Deterioration/Air Oven, ASTM D573: Pass.
        3. Compression Set, ASTM D395: 2.29 percent Compression Set.
        4. Tensile Strength, ASTM D412: 132.92 psi (917 kPa).
        5. Elongation at Break, ASTM D412: 56.46 percent.
        6. Tear Strength, ASTM D624: 34.66 lbf per inch (6.25 N per mm).
        7. Flammability:
           1. Burning Pill, ASTM D 2859: Pass.
           2. Critical Radiant Flux, ASTM E 648: No Classification.
        8. Determination of Accessibility, ASTM F1951: Meets or Exceeds requirements.
        9. Water Permeability, ASTM F1551: 43.8 inches per hr (1112.5 mm per hr).
        10. Durometer Hardness, ASTM D2240: 55.1.
        11. Static Coefficient of friction, ASTM C1028: Dry: .63. Wet: .47
        12. Taber Abrasion, Wear index, ASTM C501: 94.4
     2. Interlocking Tiles: Resilient, interlocking, playground safety surfacing tiles.
        1. Compliance: Meet and exceed CSPC guidelines for impact attenuation.
        2. Material: Compression-molded, recycled rubber and binding agents.
        3. Tile Locking: U-shaped male and female configuration running full length on all 4 sides to lock tiles to adjacent tiles.
        4. Top Edges: Chamfered.
        5. Tile Bottom: Hollow core Tunnel Shaped Grid pattern.
        6. Wear Layer:
           1. Standard Buffings: Rubber Buffings: 10 Mesh. Minimum .50 inch (13 mm) thick.
           2. Standard EPDM: EPDM Granules: 0.02 to 0.06 inches (0.5 to 1.5 mm). Minimum .50 inch (13 mm) thick.
        7. Nominal Size: 23-13/16 x 23-13/16 inches (605 x 605 mm). Installed Size: 24 x 24 -inches (610 x 610 mm).
        8. Thickness:
           1. Critical Fall Height 4 Feet (1219 mm): 2.25 inches (57 mm).
           2. Critical Fall Height 6 Feet (1829 mm): 2.75 inches (70 mm).
           3. Critical Fall Height 8 Feet (2438 mm): 3.25 inches (83 mm).
           4. Critical Fall Height 10 Feet (3048 mm): 4.25 inches (108 mm).
        9. Buffing Top Colors: Green. Percent Color: 100.
        10. Buffing Top Colors: Blue. Percent Color: 100
        11. Buffing Top Colors: Brown. Percent Color: 100.
        12. Buffing Top Colors: Tan. Percent Color: 100.
        13. Buffing Top Colors: Grey. Percent Color: 100.
        14. Buffing Top Colors: Red. Percent Color: 100.
        15. Buffing Top Colors: Black. Percent Color: 100.
        16. EPDM Granules: Beige. Percent Color: 50, 75, or 90 percent
        17. EPDM Granules: Blue. Percent Color: 50, 75, or 90 percent
        18. EPDM Granules: Dark Blue. Percent Color: 50, 75, or 90 percent
        19. EPDM Granules: Bright Blue. Percent Color: 50, 75, or 90 percent
        20. EPDM Granules: Beige/Brown. Percent Color: 50, 75, or 90 percent
        21. EPDM Granules: Brown. Percent Color: 50, 75, or 90 percent
        22. EPDM Granules: Eggshell. Percent Color: 50, 75, or 90 percent
        23. EPDM Granules: Yellow. Percent Color: 50, 75, or 90 percent
        24. EPDM Granules: Bright Yellow. Percent Color: 50, 75, or 90 percent
        25. EPDM Granules: Green. Percent Color: 50, 75, or 90 percent
        26. EPDM Granules: Bright Green. Percent Color: 50, 75, or 90 percent
        27. EPDM Granules: Dark Green. Percent Color: 50, 75, or 90 percent
        28. EPDM Granules: Grey. Percent Color: 50, 75, or 90 percent
        29. EPDM Granules: Dark Grey. Percent Color: 50, 75, or 90 percent
        30. EPDM Granules: Mid Grey. Percent Color: 50, 75, or 90 percent
        31. EPDM Granules: Bright Orange. Percent Color: 50, 75, or 90 percent
        32. EPDM Granules: Pink. Percent Color: 50, 75, or 90 percent
        33. EPDM Granules: Lilac. Percent Color: 50, 75, or 90 percent
        34. EPDM Granules: Red. Percent Color: 50, 75, or 90 percent
        35. EPDM Granules: Bright Red. Percent Color: 50, 75, or 90 percent
        36. EPDM Granules: Bright Orange. Percent Color: 50, 75, or 90 percent
        37. EPDM Granules: Turquoise. Percent Color: 50, 75, or 90 percent
        38. EPDM Granules: Capri Blue. Percent Color: 50, 75 or 90 percent
        39. Accessories
        40. Corners: Interlocking Inside and Outside Corner Ramp.
            1. Material: Same as playground safety surfacing tiles.
        41. Ramps: Interlocking: Material is same as playground safety surfacing tiles.
        42. Ramps: Prefabricated ADA-Compliant. Material: Standard Buffing Top.
        43. Filler Sticks: Material: Black.
        44. U-Lock: Material Black.
        45. Adhesive: Isobond ATS T04-37; Furnished by manufacturer.

\*\* NOTE TO SPECIFIER \*\* Delete article not required.

* 1. SYNTHETIC TURF (ProPlay)
     1. Basis of Design:
        1. TotTurf Landscape Synthetic Turf System as provided by Robertson Industries, Inc.
        2. TotTurf ProPlay Synthetic Turf System as provided by Robertson Industries, Inc
        3. Pup Turf System as provided by Robertson Industries, Inc.
     2. Turf Fiber:
        1. Tufted to the backing with a minimum tuft bind of 10 lbs.
        2. Tufted fiber weight: 60 oz per sq yard minimum.
        3. Turf fibers: Non-abrasive. Thickness: 100 microns. Less than 100 ppm lead chromate in all colors. Must be from the same dye lots.
           1. Guaranteed for 8 years not to fade or fail (as distinguished from a change in texture) or have a pile height decrease to 50 percent of pile height as result of UV degradation.
           2. Must retain 75 percent of its original fibril width after 10,000 cycles on the Lisport Studded Roll Test Machine.
        4. Pile fiber Characteristics:
           1. Linear Density (Denier) per ASTM D1577: 13600.
           2. Yarn Thickness per ASTM D3218: 100 Microns (PE Mono); 100 Microns (PP).
           3. Tensile Strength per ASTM D2256: 71 N (PE Mono);16.5 N (PP).

\*\* NOTE TO SPECIFIER \*\* The following three paragraphs apply to the Landscape PL Product only. Delete if not required.

* + - * 1. Pile Weight ASTM D5848: 80 oz per sq yd, plus or minus 5 percent.
        2. Finished Pile Height per ASTM D 5823: 1.75 inches (44 mm).
        3. Product Weight (total) per ASTM D3218: 107 oz per sq yd.

\*\* NOTE TO SPECIFIER \*\* The following three paragraphs apply to the Pup Turf Product only. Delete if not required.

* + - * 1. Pile Weight ASTM D5848: 60 oz per sq yd, plus or minus 5 percent.
        2. Finished Pile Height per ASTM D 5823: 1 inches (25 mm).
        3. Product Weight (total) per ASTM D3218: 87 oz per sq yd.
        4. Primary Backing Weight per ASTM D2256: 7.4 oz per sq yd.
        5. Secondary Coating Weight per ASTM D5848: 20 oz per sq yd.
        6. Fabric Width per ASTM D5793: 15 ft (4.57 m).
        7. Tuft Gauge per ASTM D5793: 3/8 inches (10 mm).
        8. Grab Tear Strength per ASTM D5034: 200 lbsf.
        9. Tuft Bind per ASTM D1335: Greater than 10 lbsf.
        10. Infill (Sand): 2 lbs Silica Sand.
    1. Backing Material:
       1. Primary Backing: Dual layered woven polypropylene. Weight: 7.0 oz per sq yd.
       2. Secondary Backing: Heat activated polyurethane coating with no vegetable-based polyols. Weight: 20 oz per sq yd.
          1. Must saturate the primary backing and lock the fiber tufts in place to the primary backing.
          2. Tuft Bind Strength: 10 lbsf.
          3. Drainage Perforations: 3/16 to 1/4 inches (5 to 6 mm) diameter at 4 inches (102 mm) or less on center each way. Non-perforated backing is not acceptable.
    2. Turf roll seams: to be sewn or glued on site so that no openings larger than the porous backing mat openings are created. All turf fabric edges to be securely bound as per the perimeter detail design. Adhesives for joining seams of turf together shall be Nordot 34G Glue, Mapei 2K, Turf Claw, hot melt technology or equivalent. No substitutions.
    3. Fabric surface: To be constructed and installed in minimum widths of 15 feet (4.572 m) with no longitudinal or transverse seams.
    4. The entire system shall be resistant to weather, including ultra-violet light and heat degradation; insects, rot, mildew, and fungus growth and be non-allergenic and non-toxic.
    5. The turf material shall be non-combustible and pass the DIN standard Pill Burn test or ASTM D2859.
    6. Synthetic Glue Material:
       1. Adhesive products shall be Nordot 34G, Mapei 2K, Turf Claw, hot melt technology or equivalent as approved by the engineer.
       2. Any adhesive products required for the installation of a proposed turf system shall be purpose-suited to the system. The material and application methods shall be as recommended by the adhesive manufacturer.
       3. Disposal of adhesive containers and unused adhesives as well as any fees resulting from such disposal shall be the responsibility of the Contractor.
    7. Synthetic Infill Material: Consists of a blend of graded, silica sand.
       - 1. Sand: Graded, dust-free silica sand. Placed on turf at 1 lbs per sq ft minimum.
         2. Sand properties:

Color: Tan.

Shape: Round non-angular. Roundness: 0.6+.

Hardness: 0.6 to 0.8 on the Mohs Scale.

Size: 0.04 inches (plus or minus 0.006 inches (1.00 mm plus or minus 0.15 mm).

Density: 90 to 95 lbs per cu ft (1442 to 1522 kg per cu m).

Dust: Less than 0.001 percent.

Angle of Repose: Less than 30 degrees.

Sand to be heavy metal safe.

* + - * 1. Envirofill: Infill for synthetic/artificial turf. Silicon dioxide coated with acrylic polymer. Product is not to contain known hazardous materials in reportable levels as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200. Product to be classified as not being toxic, corrosive, skin or eye irritants, or a strong sensitizer as defined in 16 CFR 1500.3(b)(5), and 1500.3(b)(7) - (9) of the Federal Hazardous Substances Act.

Color: Green.

Color: Tan.

Color: Red.

Color: Black.

Odor: Odorless.

pH-Value: Not applicable.

Change in Condition:

Melting point / Melting Range: 3115 degrees F (1713 degrees C).

Boiling point/Boiling Range: 4046 degrees F (2230 degrees C).

Flash point: None.

Flammability (solid, gaseous) - Product is not flammable.

Ignition temperature - Decomposition temperature - Not determined.

Auto igniting - Product is not self-igniting.

Danger of Explosion: Product does not present an explosion hazard.

Lower Explosion Limits: Not determined.

Upper Explosion Limits: Not determined.

Vapor Pressure at 3150 degrees F (1732 degrees C): 13.5 hPa (10 mm Hg).

Density at 68 degrees F (20 degrees C): 24.201 to 25.87 lbs/gal (2.9 to 3.1 g per cu cm).

Bulk Density: 110 lbs per cu ft (1762 kg per cu m).

Relative Density: Not determined.

Vapor Density: Not applicable.

Evaporation Tate: Not applicable.

Solubility in / Miscibility with Water: Insoluble.

Partition Coefficient (n-octanol/water): Not determined.

Viscosity: Dynamic - Not applicable. Kinematic - Not applicable.

Solvent Content: Organic Solvents: 0 percent. Solids: 100 percent.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. SYNTHETIC TURF (Pro Play) (Pro Play Plus) (Pro Play Elite) (Pup Turf)
     1. Basis of Design:
        1. Robertson ProPlay as provided by Robertson Industries, Inc.
        2. Robertson ProPlay Plus as provided by Robertson Industries, Inc.
        3. Robertson ProPlay Elite as provided by Robertson Industries, Inc.
        4. Robertson Pup Turf as provided by Robertson Industries, Inc.
     2. Turf Fiber:
        1. The turf fiber must be tufted to the backing with a minimum tuft bind of 10 lbs (4.5 kg).
        2. The tufted fiber weight shall be a minimum of 40 oz per sq yd (1356 grams per sq m).
        3. The turf fiber shall be non-abrasive and a minimum of 100 microns thick.
        4. The turf fiber must contain less than 100 ppm of lead chromate in all colors.
        5. The turf fibers must be from the same dye lots.
        6. The turf fibers must be guaranteed for a period of eight years not to fade or fail (as distinguished from a change in texture) or have a pile height decrease to 50 percent of pile height as result of UV degradation.
        7. The turf fiber must retain a minimum of 75 percent of its original fibril width after 10,000 cycles on the Lisport Studded Roll Test Machine.
        8. Pile Fiber Characteristics:
           1. Linear Density (Denier) per ASTM D1577: 13600.
           2. Yarn Thickness per ASTM D3218: 100 Microns (PE Mono); 100 Microns (PP).
           3. Tensile Strength per ASTM D2256: 71 N (PE Mono);16.5 N (PP).

\*\* NOTE TO SPECIFIER \*\* The following three paragraphs apply to the Robertson ProPlay 67 oz Product only. Delete if not required.

* + - * 1. Pile Weight ASTM D5848: 40 oz per sq yd (1356 grams per sq m), plus or minus 5 percent.
        2. Finished Pile Height per ASTM D 5823: 1.50 inches (38.1 mm).
        3. Product Weight (total) per ASTM D3218: 67 oz per sq yd (2272 grams per sq m).

\*\* NOTE TO SPECIFIER \*\* The following three paragraphs apply to the Robertson ProPlay Plus Product only. Delete if not required.

* + - * 1. Pile Weight ASTM D5848: 60 oz per sq yd (1865 grams per sq m), plus or minus 5 percent.
        2. Finished Pile Height per ASTM D 5823: 1.625 inches (41 mm).
        3. Product Weight (total) per ASTM D3218: 87 oz per sq yd

\*\* NOTE TO SPECIFIER \*\* The following three paragraphs apply to the Robertson ProPlay Elite Product only. Delete if not required.

* + - * 1. Pile Weight ASTM D5848: 60 oz per sq yd (2034 grams per sq m), plus or minus 5 percent.
        2. Finished Pile Height per ASTM D 5823: 1.125 inches (28.5 mm).
        3. Product Weight (total) per ASTM D3218: 87 oz per sq yd (2950 grams per sq m).
        4. Primary Backing Weight per ASTM D2256: 7.4 oz per sq yd (251 grams per sq m).
        5. Secondary Coating Weight per ASTM D5848: 20 oz per sq yd (678 grams per sq m).
        6. Fabric Width per ASTM D5793: 15 ft (4.57 m).
        7. Tuft Gauge per ASTM D5793: 3/8 inches (10 mm).
        8. Grab Tear Strength per ASTM D5034: 200 lbsf (890 N).
        9. Tuft Bind per ASTM D1335: Greater than 10 lbsf (44.5 N).
        10. Infill (Sand): 2 lbs (0.91 kg) Silica Sand.
    1. Backing Material:
       1. Primary Backing: Dual layered woven polypropylene. Weight: 7.0 oz per sq yd (237 grams per sq m).
       2. Secondary Backing: Heat activated polyurethane coating with no vegetable-based polyols. Weight: 20 oz per sq yd (678 grams per sq m).
          1. Must saturate the primary backing and lock the fiber tufts in place to the primary backing.
          2. Tuft Bind Strength: 10 lbsf (44.5 N).
          3. Drainage Perforations: 3/16 to 1/4 inches (5 to 6 mm) diameter at 4 inches (102 mm) or less on center each way. Non-perforated backing is not acceptable.
    2. Turf roll seams: to be sewn or glued on site so that no openings larger than the porous backing mat openings are created. All turf fabric edges to be securely bound as per the perimeter detail design. Adhesives for joining seams of turf together shall be Nordot 34G Glue, Mapei 2K, Turf Claw, hot melt technology or equivalent. No substitutions.
    3. Fabric surface: shall be constructed and installed in minimum widths of 15 ft (4.572 m) with no longitudinal or transverse seams.
    4. The entire system shall be resistant to weather, including ultra-violet light and heat degradation; insects, rot, mildew, and fungus growth and be non-allergenic and non-toxic.
    5. The turf material shall be non-combustible and pass the DIN standard Pill Burn test or ASTM D2859.
    6. Synthetic Glue Material:
       1. Adhesive products shall be Nordot 34G, Mapei 2K, Turf Claw, hot melt technology or equivalent as approved by the engineer.
       2. Any adhesive products required for the installation of a proposed turf system shall be purpose-suited to the system. The material and application methods shall be as recommended by the adhesive manufacturer.
       3. Disposal of adhesive containers and unused adhesives as well as any fees resulting from such disposal shall be the responsibility of the Contractor.
    7. Synthetic Infill Material: Consists of a blend of graded, silica sand.
       1. Sand: Graded, dust-free silica sand. Placed on turf at 1 lbs per sq ft minimum. Sand properties:
          1. Color: Tan.
          2. Shape: Round non-angular. Roundness: 0.6+
          3. Hardness: 0.6 to 0.8 on the Mohs Scale.
          4. Size: 0.04 inches plus or minus 0.006 inches (1.00 mm plus or minus 0.15 mm.
          5. Density: 90 to 95 lbs per cu ft (1442 to 1522 kg per cu m).
          6. Dust: Less than 0.001 percent.
          7. Angle of Repose: Less than 30 degrees/
          8. Sand to be heavy metal safe.
       2. Envirofill: Infill for synthetic/artificial turf. Silicon dioxide coated with acrylic polymer. Product is not to contain known hazardous materials in reportable levels as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200. Product to be classified as not being toxic, corrosive, skin or eye irritants, or a strong sensitizer as defined in 16 CFR 1500.3(b)(5), and 1500.3(b)(7) - (9) of the Federal Hazardous Substances Act.
          1. Color: Green.
          2. Color: Tan.
          3. Color: Red.
          4. Color: Black.
          5. Odor: Odorless.
          6. pH-Value: Not applicable.
          7. Change in Condition:

Melting Point / Melting Range: 3115 degrees F (1713 degrees C).

Boiling Point / Boiling Range: 4046 degrees F (2230 degrees C).

* + - * 1. Flash point: None.
        2. Flammability (Solid, Gaseous): Product is not flammable.
        3. Ignition Temperature and Decomposition Temperature: Not determined.
        4. Auto Igniting: Product is not self-igniting.
        5. Danger of explosion: Product does not present an explosion hazard.

Lower Explosion Limits: Not determined.

Upper Explosion Limits: Not determined.

* + - * 1. Vapor pressure at 3150 degrees F(1732 degrees C): 13.5 hPa (10 mm Hg)
        2. Density at 68 degrees F (20 degrees C): 24.201 to 25.87 lbs/gal (2.9 to 3.1 grams per cu m).
        3. Bulk Density: 110 lbs per cu ft (1762 kg per cu m).
        4. Relative Density: Not determined.
        5. Vapor Density: Not applicable.
        6. Evaporation Rate: Not applicable.
        7. Solubility in / Miscibility with Water: Insoluble.
        8. Partition coefficient (n-octanol/water): Not determined.
        9. Viscosity: Dynamic: Not applicable; Kinematic: Not applicable.
        10. Solvent Content: Organic solvents - 0.0 percent, Solids: 100.0 percent.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. PLAYGROUND RESILIENT SURFACING, POURED IN PLACE (TOTTURF)
     1. Product: TotTurf PIP Bonded Rubber. Unitary synthetic single density rubber seamless surface. Poured-in-place, single layer system of desired thickness.
        1. Rubber: From Rubber Designs. Address: 7629 Adairsville Hwy, Adairsville GA 30103; Toll Free: 800-653-7529; Tel: 706-383-7528; Fax: 706-334-2403. URL: [www.rubberdesigns.com](http://www.rubberdesigns.com)
        2. Urethane: The Dow Chemical Company. Address: 2030 Willard H Dow Center, Midland, MI 48674; Phone: 800-258-2436; Emergency Contact Number: 800-424-9300; Email: SDSQuestion@dow.com
        3. Performance Requirements:
           1. Impact Attenuation: According to ASTM F1292-18 or latest version.
           2. Accessibility of Surface Systems: According to ASTM F 1951-14 or latest version.
        4. Bonded Rubber Surfacing Impact Course: Manufactured from 100 percent post-consumer waste tire containing no metal or lead.
           1. Thickness: 1.5 inches (38 mm) minimum using +4 SBR Mulch Buffings Sieves 0.5 inches (12.5 mm) (0 percent) 20 Sieve (98 to 100 percent) and the pan (0 to 2 percent).
           2. Weight/Packaging: Specific Gravity per ASTM D53217: 0.72 oz per cu inch (1.25 grams per cu cm).
           3. Bulk Density per ASTM D1859: 20 lbs per cu ft (320.4 kg per cu m).
           4. Rubber to Urethane Ratio: 20 percent; 9 lbs (4.1 kg) or urethane per 50 lbs (22.7 kg) of rubber.
           5. Trade Name: Rubber Designs Colored Rubber Buffings.

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

* + - * 1. Color: Red.
        2. Color: Brown.
        3. Color: Green.
        4. Color: Yellow.
        5. Color: Cypress
        6. Color: Black.
        7. Color: Pre-mixed combinations of Rainbow.
        8. Color: Pre-mixed combinations of Rustic.
        9. Color: Pre-mixed combinations of Jungle.
      1. Composition:
         1. CAS No. 1334-86-4. Component: Carbon Black.

Percent: Less than 50.

* + - * 1. CAS No. 1314-13-2. Component: Zinc Oxide.

Percent: 1 to 5.

* + - * 1. CAS No. 26780-96-1. Component: Trimethyl Dehydroquinoline, Homopolymer.

Percent: Less than 3.

* + - * 1. CAS No. 9003-55-8. Component: Styrene Butadiene Rubber.

Percent: Less than 60.

* + - * 1. CAS No. 9006-04-6. Component: Natural Rubber.

Percent: Less than 40.

* + - * 1. CAS No. 9003-35-4. Component: Phenol Formaldehyde Resin.

Percent: Less than 5.

* + - * 1. CAS No. 64742-54-7. Component: Heavy Paraffinic Distillate.

Percent: Less than 20.

* + - * 1. CAS No. 137-26-8. Component: Tetramethylthiuram Disulfide.

Percent: Less than 4.

* + - 1. Binder:
         1. Polyurethane Weight Range: 8.5 to 9.0 lbs per gallon (1.02 to 1.14 Kg per L).
         2. Manufacturer is permitted to modify the type of urethane required to match extreme weather conditions. Substitutions must be equal to or exceed original quality, such as DOW Voramer MR 1105 and MR 1165 Urethanes.
         3. Not Acceptable:

No Toluene Diphenyl Isocyanate (TDI) is to be used.

No filler materials to be used in urethane such as plasticizers.

No heavy metals in the catalyzing agent.

* + - 1. Critical Height: Per ASTM 1292 and IPEMA Certification.
      2. Overall Thickness: 1.75 inches = 4 ft CFH
      3. Overall Thickness: 2.25 inches = 5 ft CFH
      4. Overall Thickness: 2.75 inches = 6 ft CFH
      5. Overall Thickness: 3.25 inches = 7 ft CFH
      6. Overall Thickness: 3.75 inches = 8 ft CFH
      7. Overall Thickness: 4.75 inches = 10 ft CFH
      8. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location indicated.
      9. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by playground surface system manufacturer.
    1. Product: TotTurf PIP 5/500. Poured in Place.Attenuation Cushion Layer: Surface: Recycled rubber mixed with a polyurethane binder.Wear Course: EPDM mixed with polyurethane aromatic binder.
       1. Surfaces shall comply with ADA and CPSC guidelines as well as ASTM Standards. The manufacturer is to be certified by IPEMA, a third-party testing organization for playground surfaces and equipment.
       2. Performance Requirements:
          1. Area Safety: Poured in place within playground use zones shall meet or exceed the performance requirements of the CPSC, ADA, and Fall Height Test ASTM F1292-18.

Surface: To yield a peak deceleration of 100 G-max and peak Head Injury Criteria (HIC) value of 500 for head-first fall from highest accessible portion of play equipment installed, as shown on Drawings.

IPEMA certification is required.

ASTM F1292-18, section 15, the laboratory test used to determine critical fall height must be conducted on surfacing material samples identical in design, materials, components, and thickness and manufactured as the installed playground surface.

ASTM F3351-19, the standard test method for playground surface impact testing in laboratory at specified test height for 8 ft critical fall height.

* + - * 1. Accessibility: Children's outdoor play areas must be in compliance with the Uniform Federal Accessibility Standards (UFAS) FED-STD-795 and the Architectural and Engineer Instructions (9AEI) Design Criteria.
        2. Americans with Disabilities Act Requirements. Accessibility Guidelines(ADAAG) 28 CFR Part 36 that provide equal or greater accessibility than the requirements of UFAS must also be met in children's outdoor play areas.
        3. Poured in place surfaces intended to serve as accessible paths of travel for persons with disabilities shall be firm, stable and slip resistant, and meet the requirements of ASTM F 1951-14 and ASTM F1292-18 and ASTM F3351-19.
        4. Poured in place surface shall provide HIC values of less than 500 and the G-Max rating of less than 100.
      1. Impact Attenuation Cushion Layer: Consists of 100 percent Robertson Industries Inc. Buffings.
         1. Binder: 5 to 12 percent of total weight of material and provide 100 percent particle coating.
         2. Manufacturer: Robertson Industries Inc.
      2. Wear Course: Ethylene Propylene Diene Monomer (EPDM) granules with polyurethane binder formulated to produce an even, uniform, seamless surface unless otherwise agreed upon by owner.
         1. EPDM: Peroxide cured. EPDM Content: 26 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
         2. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
         3. EPDM Granules: 1 to 4 mm. Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         4. Wear Couse Thickness: Minimum 0.5 inch (13 mm).
         5. Wear course is to be porous.
         6. Manufacturers: Gezolan, Sparton Enterprises LLC
      3. Binder:
         1. No Toluene Diphenyl Isocyanate (TDI) will be used.
         2. No filler materials to be used in urethane such as plasticizers.
         3. Catalyzing Agent: Must contain no heavy metals.
         4. Weight of polyurethane: 8.5 to 9.5 lbs per gal (1.02 to 1.14 Kg per L).
         5. Manufacturer may modify the urethane type to match extreme weather conditions. Substitutions must equal or exceed original quality.
         6. Binder: Aromatic VORAMER MR Products. Manufacturer: DOW Chemical
         7. Binder: Aromatic Urethane Stobielast S 1020. Manufacturer: Stockmeier Urethanes, USA, Inc.
         8. Binder: Aliphatic Urethane Premium, Non-Ambering. Manufacturer: Accella Polyurethane Systems
      4. Tot Turf Advantage inserts: Thermal Plastic Vulcanized angular granules.
         1. Shore A hardness: 60 to 70 A. Particle Size: 0.02 to 0.06 inches (0.5 to 1.5 mm).
         2. Insert Thickness: 0.5 inch (13 mm).
         3. Insert to be porous.
         4. Aromatic urethane to be used as a binder.
         5. Location: Install under swings, swing bays, and slide exits, unless otherwise noted in Drawings. Customer to approve location of wear mat inserts.
         6. Standard Color: Terra Cotta Red 0.02 to 0.06 inches (0.5 to 1.5 mm).
         7. Standard Color: Blue 0.02 to 0.06 inches (0.5 to 1.5 mm).
         8. Standard Color: Green 0.02 to 0.06 inches (0.5 to 1.5 mm).
         9. Standard Color: Beige 0.02 to 0.06 inches (0.5 to 1.5 mm).
         10. Size: Swing bay use locations are to have TPV Inserts inclusive of all outside bay structure poles. Singular swings and slide exits shall be 48 x 48 x 0.5 inches (1219 x 1219 x 13 mm).
    1. Product: TotTurf PIP 1.5 Inch (38 mm) Renew. Poured in Place. Attenuation Cushion Layer: Surface: Recycled rubber mixed with a polyurethane binder. Wear Course: TPV or EPDM mixed with polyurethane aromatic or aliphatic binder.
       1. Surfaces shall comply with ADA and CPSC guidelines as well as ASTM Standards. The manufacturer is to be certified by IPEMA, a third-party testing organization for playground surfaces and equipment.
       2. Performance Requirements:
          1. Area Safety: Poured in place within playground use zones shall meet or exceed the performance requirements of the CPSC, ADA, and Fall Height Test ASTM F1292-18.

Surface: To yield a peak deceleration of 200 G-max and peak Head Injury Criteria (HIC) value of 1000 for head-first fall from highest accessible portion of play equipment installed, as shown on Drawings.

IPEMA certification is required.

ASTM F1292-18, section 4.3.3, the laboratory test used to determine critical fall height must be conducted on surfacing material samples identical in design, materials, components, and thickness and manufactured as the installed playground surface.

Testing: Critical Fall Height of Five, Six, and Eight feet have been tested in accordance with Section 15 - Critical Fall Height Test Procedure of ASTM F1292-18.

* + - * 1. Accessibility: Children's outdoor play areas must be in compliance with the Uniform Federal Accessibility Standards (UFAS) FED-STD-795 and the Architectural and Engineer Instructions (9AEI) Design Criteria.
        2. Americans with Disabilities Act Requirements. Accessibility Guidelines(ADAAG) 28 CFR Part 36 that provide equal or greater accessibility than the requirements of UFAS must also be met in children's outdoor play areas.
        3. Poured in place surfaces intended to serve as accessible paths of travel for persons with disabilities shall be firm, stable and slip resistant, and meet the requirements of ASTM F 1951-14 and ASTM F1292-18
      1. Impact Attenuation Cushion Layer: Recycled styrene butadiene rubber (SBR) and/or cryogenic crumb rubber and/or pre consumer postindustrial reclaimed scrap rubber adhered with a 100 percent solids polyurethane binder to form a resilient porous material.
         1. Strands of SBR: From 0.02 to 0.08 inches (0.5 to 2.0 mm) in thickness by 0.12 to 0.8 inches (3.0 to 20 mm) in length.
         2. Chunk Premium Black Rubber Granules: Pre-consumer, post-industrial, reclaimed rubber, granulated through a 5/8 inch (16 mm) screen containing less than 2 percent dust.
         3. Chunk Premium Black Rubber Granules:

Manufacturer: American Recycling Center, Inc.

Address: 655 Wabassee Drive, Owosso, MI 48867.

Phone: (989) 725-5100.

* + - * 1. SBR Crumb Rubber (5 to 9 Mesh) using sieve analysis ASTM D5644 with a fiber content of 0.1 percent or less.
        2. Binder: 5 to 12 percent of total material weight, providing 100 percent particle coating.
        3. Compatible with wear course and must meet requirements for impact attenuation.
        4. Manufacturer: Robertson Industries Inc.
      1. Wear Course: Ethylene Propylene Diene Monomer (EPDM) granules with polyurethane binder formulated to produce an even, uniform, seamless surface up to 2000 sq ft (185.8 sq m).
         1. EPDM: Peroxide cured. EPDM Content: 24 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
         2. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
         3. EPDM Granules: 0.06 to 0.16 inches (1.5 to 4 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         4. Wear Couse Thickness: Minimum 0.50 inch (13 mm).
         5. Wear course is to be porous.
         6. Manufacturers:

Gezolan EPDM, Sparton Enterprises LLC

Rosehill TPV

* + - 1. Wear Course:
         1. TPV Granules: Thermal Plastic Vulcanized (TPV) granules with polyurethane binder formulated to produce even, uniform, uniform, seamless surface unless otherwise agreed upon by owner.
         2. TPV Granules: Thermal Plastic Vulcanized (TPV) granules 0.02 to 0.06 inches (0.5 to 1.5 mm) diameter with polyurethane binder formulated to produce even, uniform, uniform, seamless surface unless otherwise agreed upon by owner.
         3. TPV: Peroxide cured. TPV Content: 26 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
         4. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
         5. TPV Granules: 0.04 to 0.16 inches (1 to 4 mm) or 0.02 to 0.20 inches (0.5 to 5 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         6. TPV Granules: 0.02 to 0.20 inches (0.5 to 5 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         7. Wear Couse Thickness: Minimum 0.5 inch (13 mm).
         8. Wear course is to be porous.
         9. Manufacturers: Rosehill Polymers.
      2. Binder: Aromatic or Aliphatic urethanes are to be used.
         1. No Toluene Diphenyl Isocyanate (TDI) will be used.
         2. No filler materials to be used in urethane such as plasticizers.
         3. Catalyzing Agent: Must contain no heavy metals.
         4. Weight of polyurethane: 8.5 to 9.5 lbs per gal (1.02 to 1.14 Kg per L).
         5. Manufacturer may modify the urethane type to match extreme weather conditions. Substitutions must equal or exceed original quality.
         6. Binder: Aromatic VORAMER MR Products. Manufacturer: DOW Chemical.
         7. Binder: Aromatic Urethane Stobielast S 1020. Manufacturer: Stockmeier Urethanes, USA, Inc.
         8. Binder: Aliphatic Urethane Premium, Non-Ambering. Manufacturer: Accella Polyurethane Systems.
    1. Product: TotTurf PIP Refresh and Patching Repairs: Polyurethane binder, EPDM/TPV rubber granules and 100 percent recycled shredded tire buffing's or organic SBR crumb rubber. Applied in two perpendicular layers with additional coats in high traffic areas. Ten sq ft of EPDM/TPV granules mixed with aromatic or aliphatic binder in addition to SBR tire buffing's or SBR granules will be installed for patching and repairs to each project location.
       1. Performance Requirements:
          1. Area Safety: Poured in place within playground use zones shall meet or exceed the performance requirements of the CPSC, ADA, and Fall Height Test ASTM F1292-18.

Surface: To yield a peak deceleration of 200 G-max and peak Head Injury Criteria (HIC) value of 1,000 for head-first fall from highest accessible portion of play equipment installed, as shown on Drawings.

IPEMA certification is required.

ASTM F1292-18, section 15, the laboratory test used to determine critical fall height must be conducted on surface material samples identical in design, materials, components, and thickness and manufactured as the installed playground surface.

* + - * 1. Accessibility: Children's outdoor play areas must be in compliance with the Uniform Federal Accessibility Standards (UFAS) FED-STD-795 and the Architectural and Engineer Instructions (9AEI) Design Criteria.
        2. Americans with Disabilities Act Requirements. Accessibility Guidelines(ADAAG) 28 CFR Part 36 that provide equal or greater accessibility than the requirements of UFAS must also be met in children's outdoor play areas.
        3. Poured in place surfaces intended to serve as accessible paths of travel for persons with disabilities shall be firm, stable and slip resistant, and meet the requirements of ASTM F 1951-14 and ASTM F1292-18.
      1. Wear Course: Ethylene Propylene Diene Monomer (EPDM) granules with polyurethane binder formulated to produce an even, uniform, seamless surface unless otherwise agreed upon by owner.
         1. EPDM: Peroxide cured. EPDM Content: 26 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
         2. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
         3. EPDM Granules: 1 to 4 mm. Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         4. Wear Couse Thickness: Minimum 0.5 inch (13 mm).
         5. Wear course is to be porous.
         6. Manufacturers:

Gezolan EPDM, Sparton Enterprises LLC

Rosehill TPV

* + - 1. Wear Course:
         1. TPV Granules: Thermal Plastic Vulcanized (TPV) granules with polyurethane binder formulated to produce even, uniform, uniform, seamless surface unless otherwise agreed upon by owner.
         2. TPV Granules: Thermal Plastic Vulcanized (TPV) granules 0.02 to 0.06 inches (0.5 to 1.5 mm) diameter with polyurethane binder formulated to produce even, uniform, uniform, seamless surface unless otherwise agreed upon by owner.
         3. TPV: Peroxide cured. TPV Content: 26 percent. A processing aid to prevent hardness with 26 percent poly content to maintain dynamic testing characteristics, weatherization, and UV stability.
         4. Hardness per ASTM D2240: Shore A: 55 to 65. A minimum of 26 percent rubber hydrocarbons.
         5. TPV Granules: 0.04 to 0.16 inches (1 to 4 mm) or 0.02 to 0.20 inches (0.5 to 5 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         6. TPV Granules: 0.02 to 0.20 inches (0.5 to 5 mm). Binder: Not less than 20 percent of total weight of rubber used in the wear surface and provide 100 percent coating of the particles.
         7. Wear Couse Thickness: Minimum 0.5 inch (13 mm).
         8. Wear course is to be porous.
         9. Manufacturers: Rosehill Polymers
      2. Attenuation Cushion Layer: Recycled styrene butadiene rubber (SBR) and/or cryogenic crumb rubber and/or pre consumer postindustrial reclaimed scrap rubber adhered with a 100 percent solids polyurethane binder to form a resilient porous material.
         1. Strands of SBR: From 0.02 to 0.08 inches (0.5 to 2.0 mm) in thickness by 0.12 to 0.79 inches (3.0 to 20 mm) in length.
         2. Chunk Premium Black Rubber Granules: Pre-consumer, post-industrial, reclaimed rubber, granulated through a 5/8 inch (16 mm) screen containing less than 2 percent dust.
         3. Chunk Premium Black Rubber Granules:

Manufacturer: American Recycling Center, Inc.

Address: 655 Wabassee Drive, Owosso, MI 48867

Phone: (989) 725-5100

* + - * 1. SBR Crumb Rubber (5 to 9 Mesh) using sieve analysis ASTM D5644 with a fiber content of 0.1 percent or less.
        2. Binder: 5 to 12 percent of total material weight, providing 100 percent particle coating.
        3. Compatible with wear course and must meet requirements for impact attenuation.
        4. Manufacturer: Robertson Industries Inc., Sparton Enterprises LLC, ARC
      1. Binder:
         1. No Toluene Diphenyl Isocyanate (TDI) will be used.
         2. No filler materials to be used in urethane such as plasticizers.
         3. Catalyzing Agent: Must contain no heavy metals.
         4. Weight of polyurethane: 8.5 to 9.5 lbs per gal (1.02 to 1.14 Kg per L).
         5. Manufacturer may modify the urethane type to match extreme weather conditions. Substitutions must equal or exceed original quality.
         6. Binder: Aromatic VORAMER MR Products. Manufacturer: DOW Chemical
         7. Binder: Aromatic Urethane Stobielast S 1020. Manufacturer: Stockmeier Urethanes, USA, Inc.
         8. Binder: Aliphatic Urethane Premium, Non-Ambering. Manufacturer: Accella Polyurethane Systems

\*\* NOTE TO SPECIFIER \*\* Delete article not required.

* 1. POURED IN PLACE PEDESTRIAN TRAFFIC SURFACING (TOTTURF)
     1. Poured in Place Surface: TOTTURF TRAILS recreational surfacing system, porous single pour, poured in place aggregate and rubber system as manufactured by Robertson. For walkways, golf cart paths, bike paths, tree-wells and other pedestrian areas requiring a firm and porous surface.
        1. The finished surface to be porous and capable of being installed at varying thicknesses.
        2. Primer: 100 percent solids urethane primer/sealer designed to be low viscosity for optimal penetrating abilities.
        3. Composition: Mixture of 3/8 inch (10 mm) pea gravel; 100 lbs (45.4 kg), TPV or EPDM colored rubber granules; 55 lbs (25 kg), and black SBR rubber granules; 55 lbs (25 kg) mixed with a 100 percent solids moisture cured aromatic or aliphatic polyurethane binder installed at the appropriate thickness.
           1. SBR Rubber Granules: 0.04 to 0.125 inches (1 to 3 mm).
           2. TPV Colored Granules: 0.04 to 0.16 inches (1 to 4 mm).
           3. EPDM colored Granules: 0.04 to 0.16 inches (1 to 4 mm).
        4. The system color should be selected by the owner prior to bid.
        5. Depth on Asphalt Substrate: 3/4 inch (19 mm) minimum over top of well-prepped or new asphalt.
        6. Depth on Concrete Substrate: 3/4 inch (19 mm) minimum over top of well-prepped or new concrete.
        7. Depth on Aggregate Sub Base Substrate: 1.5 inch (38 mm) minimum over top of well-prepare aggregate sub base.
        8. Depth may vary due to specific load bearing requirements.
        9. Finished Texture: Slip resistant, smooth, and even.
        10. Cure Time, Walk On: 24-48 hours.
        11. Cure Time, Full Cure: 72 hours.

\*\* NOTE TO SPECIFIER \*\* Delete article not required.

* 1. HEAVY DUTY - WEAR MAT
     1. Basis of Design: Wear Mats as manufactured by Robertson. A combination of 15 percent EPDM rubber, 85 percent recycled SBR rubber, and a single component polyurethane binding agent.
        1. Size: 44 x 48 inches (118 x 1219 mm) x 1 inch (25 mm) thick. Square Feet: 14.667. Average Weight: 57 lbs.
           1. Molded Tolerance: plus or minus 1 mm.
        2. Water Permeability: Percolation rated no less than 0.31 gallons per sq yd (1.4 liters per sq m).
        3. Coefficient of Friction per ASTM D1894: Greater than 0.73 dry.
        4. Color: Black with gray specks.
        5. Warranty: To be free from defects in materials and workmanship for one year from date of purchase.

\*\* NOTE TO SPECIFIER \*\* This article provides the specifications for a poured in place safety surfacing system composed of a nonporous wearing layer upper membrane and an underlying impact attenuation cushion layer.

* + - 1. There are variations in the final specifications as required by the Client.
      2. Owner and architect to be aware that some specifications, testing, certifications and the like, as noted below, are inclusive of, predicated upon and incorporate a "Cushioned Layer" (as defined below), to assist in Critical Fall Height, into the final system. In some cases, no equipment with such Critical Fall Height Requirements exists on projects wherein SPLASH TREAD may be specified. In such cases, only the Wear Course Layer, as specified below, may need to be used. In such cases, specifications, materials, procedures, testing and certification data specific to said, "Cushion Layer" and Critical Fall Height does not apply and shall be considered stricken from the specification.
      3. Delete options not required.
  1. RECYLCLED SHREDDED RUBBER SURFACING (TOTTURF)
     1. Basis of Design: TotTurf Recycled Shredded Rubber as manufactured by Robertson. Manufactured from ground recycled tire rubber with loose fiber removed and free of foreign materials. A mixture of crumb rubber and rubber buffing's to aid in compaction.
     2. Performance Requirements:
        1. When installed to a compacted depth of 6 inches (152 mm), when tested according to ASTM F1292, have a critical height of 12 ft (3.658 m). minimum. (i.e. G-max less than 200, HIC less than 1000),
        2. Must pass ASTM F3012 testing for size distribution, hazardous metal content, and tramp metal content for loose-fill rubber that is intended to be used as a playground surface.
        3. IPEMA Certified: Manufacturer must provide proof of certification. "In the interest of public playground safety, IPEMA provides an independent laboratory which validates a manufacturer's certification of conformance to ASTM F1292. A list of current validated products, their thickness and critical heights may be viewed at [www.ipema.com](http://www.ipema.com) .
     3. Composition: 100 percent ground recycled tire rubber from whole passenger and/or truck tires with loose fiber removed and free of foreign materials. Rubber is considered a non-hazardous filled hydrocarbon polymer that is non-toxic, non-metallic, and principally a carbon-based organic material.
        1. Free Metal Content: Less than 0.01 percent (Wire Free) per ASTM 5603
        2. Maximum Loose Fiber Content: Less than 0.01 percent by weight.
        3. Colorant: Less than 0.75 percent by weight.
     4. Dimensions: 100 percent Shredded Rubber:
        1. Average Dimensions: 1/2 inch (13 mm) x 2 inch (51 mm) length,
     5. Properties:
        1. Moisture Absorption: 0 percent maximum by weight.
        2. Moisture Content per ASTM 1509: Less than 1 percent by weight.
        3. Density: 26 to 28 lbs per cu ft (416.5 to 448.5 kg per cu m).
        4. Acute Toxicity of Colorant: Greater than 5000 mg/kg (rat). Meets criteria. Oral LD50 Test.
     6. Toxicity: Product must prove to be non-toxic and may not produce toxic leachate.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ENGINEERED WOOD FIBER (TOTTURF)
     1. Basis of Design: TotTurf Engineered Wood Fiber as manufactured by Roberston. May be installed over compacted earth. If it is deemed that additional drainage is necessary; a layer of gravel can also be a suitable substrate.
     2. Performance Requirements:
        1. Accessibility of Surface Systems per ASTM F1951: Determination of accessibility of surface systems under and around playground equipment.
        2. Impact Attenuation per ASTM F1292: Impact attenuation of surface systems under and around playground equipment.
        3. Standard for Engineered Wood Fiber per ASTM F2075: Minimum characteristics for those factors that determine particle size, consistency, purity, and ability to drain.
        4. IPEMA Certification: Manufacturer must provide proof of certification. "In the interest of public playground safety, IPEMA provides an independent laboratory which validates a manufacturer's certification of conformance to ASTM F1292 and ASTM F2075. A list of current validated products, their thickness and critical heights may be viewed at [www.ipema.org](http://www.ipema.org) ."
     3. Composition: Product is manufactured of a ground wood fiber comprised of softwoods and/or hardwoods, consisting of randomly sized wood fibers the majority of which do not exceed 2 inch (51 mm) in length and no more than 15 percent fines to aid in compaction.
     4. Product to have minimal bark and to be free of twigs, leaf debris and other organic material.
     5. Product depth, after installation, must be in accordance with the procedure described in ASTM F1292 and meet guidelines for critical height as set forth by the Consumer Product Safety Commission for use of wood products for protective surfacing.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until the substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   4. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
   5. CLEANING AND PROTECTION
      1. Clean products in accordance with the manufacturers recommendations.
      2. Manufacturer installers shall work to minimize excessive adhesive on adjacent surfaces or play equipment. Spills of excess adhesive shall be promptly cleaned.
      3. Allow to fully cure in accordance with Manufacturer's instructions. Surface to be protected by the Owner from all traffic during the curing period of at a minimum of 48 hours or as instructed by the Manufacturer.
      4. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION