SECTION 32 18 00

ATHLETIC AND RECREATIONAL SURFACING

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\*\* NOTE TO SPECIFIER \*\* FlexGround, LLC; athletic and recreational surfacing.
This section is based on the products of FlexGround, LLC, which is located at:2140 E. Cedar St.Tempe, AZ 85281Toll Free Tel: 888-571-1080Tel: 602-954-0000Email: [request info (info@flexground.com)](https://arcat.com/rfi?action=email&company=FlexGround%252C%252BLLC&message=RE%253A%2520Spec%2520Question%2520(02790fgl)%253A%2520&coid=50952&spec=02790fgl&rep=&fax=)
Web: <http://flexground.com>
 [ [Click Here](https://arcat.com/company/flexground-llc-50952) ] for additional information.
We are the premier rubber playground surfacing company in the Western United States providing colorful, design-rich safety surfacing.
We have a singular focus: To provide innovative and high-quality rubber and synthetic turf surfacing options, installed by a knowledgeable and caring staff, backed by unparalleled customer service.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Athletic and Recreational Surfacing of the following types:
			1. Rubberized, Poured-in-Place Surfacing. (FlexGround Standard, EnduraFlex, UltraFlex, Xtreme Play, FlexPlay, FlexBond, EnduraFlex with Xtreme Surfacing, Multicoat Acrylic Krete Kote)
			2. Synthetic Turf. (FlexGrass)
			3. Surface Repair and Maintenance. (FlexGrout, FlexCoat, FlexFix, FlexTop, FlexTop with Xtreme)
			4. Aquatics Surfacing. (PolySplash, KoolFlex, Xtreme Water Play)
			5. Trail Surfacing. (FlexTrail)
			6. Athletics Surfacing. (Courtscapes, SportFlex Standard, SportFlex Plus, SportFlex Ultra)
	1. RELATED SECTIONS
		1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

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

* + 1. Section 32 12 16 - Asphalt Paving (32 12 16) - Asphalt Paving.
		2. Section 03 30 00 - Cast-in-Place Concrete (03 30 00) - Cast-in-Place Concrete.
		3. Section - (11 68 13) - Playground Equipment: Playground layout (staking).
		4. Section 31 20 00 - Earth Moving (31 00 00) - Earthwork: grading, subgrade preparation.
		5. Section - (32 11 23) - Aggregate Base Courses: Subbase for resilient surfacing.
		6. Section 12 93 13 - Bicycle Racks (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 B117 - Standard Practice for Operating Salt Spray, Fog, Apparatus.
			2. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
			3. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.
			4. ASTM C190 - Method of Test for Tensile Strength of Hydraulic Cement Mortars.
			5. ASTM C297 - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
			6. ASTM C1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method.
			7. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
			8. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
			9. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
			10. ASTM D1171 - Standard Test Method for Rubber DeteriorationSurface Ozone Cracking Outdoors, Triangular Specimens.
			11. ASTM D1242 - Standard Test Methods for Resistance of Plastic Materials to Abrasion.
			12. ASTM D1418 - Standard Practice for Rubber and Rubber LaticesNomenclature.
			13. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
			14. ASTM D2859 - Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
			15. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
			16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
			17. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
			18. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
			19. ASTM F1292 - Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.
			20. ASTM F1951 - Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.
			21. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
			22. ASTM G23 - Standard Practice for Operating Light-Exposure Apparatus, Carbon-Arc Type, With and Without Water for Exposure of Nonmetallic Materials.
		2. Australia and New Zealand Standards (AS/NZS):
			1. AS/NZS 4586 - Slip Resistance Classification of New Pedestrian Surface Materials.
		3. U.S. Military Specifications (MIL):
			1. MIL-D-3134F - Deck Covering Materials.
	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 five years documented experience.
			1. Comply with currentASTM F1292Test Criteria.
		2. Installer Qualifications: Installed by Manufacturer.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
	2. 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.
	3. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	4. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	5. WARRANTY
		1. Manufacturer's Warranty: Provide manufacturer's standard limited warranty.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: FlexGround, LLC, which is located at:2140 E. Cedar St.Tempe, AZ 85281Toll Free Tel: 888-571-1080Tel: 602-954-0000Email: [request info (info@flexground.com)](https://arcat.com/rfi?action=email&company=FlexGround%252C%252BLLC&message=RE%253A%2520Spec%2520Question%2520(02790fgl)%253A%2520&coid=50952&spec=02790fgl&rep=&fax=);Web: <http://flexground.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 provisions of Section 01 60 00 - Product Requirements.

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

* 1. RUBBERIZED, POURED-IN-PLACE SURFACING
		1. Performance Requirements:
			1. Standards Compliance: ASTM D624, ASTM D2859, ASTM E303, ASTM F1292, ASTM F1951, ASTM C1028, and ASTM D412.

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: FlexGround Standard; as manufactured and supplied by FlexGround, LLC.
			1. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. The cushion layer should be porous. Delete material options not required.

* + - * 1. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: As required for Critical Fall Height indicated.
				3. Thickness: \_\_\_\_\_.
			1. Wearing Surface:
				1. Material: 0.04 to 0.12 inches (1 to 3 mm) EPDM virgin colored rubber granules bonded by FLEXGROUND binder, 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 110 pounds (50 kg) of EPDM to 22 pounds (10 kg) of binder.

* + - * 1. Minimum Thickness: 1/2 inch (12.7 mm).

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: EnduraFlex; as manufactured and supplied by FlexGround, LLC.
			1. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. The cushion layer should be porous. Delete material options not required.

* + - * 1. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: As required for Critical Fall Height indicated.
				3. Thickness: \_\_\_\_\_.
			1. Wearing Surface:
				1. Material: 0.04 to 0.16 inches (1 to 4 mm) TPV virgin colored rubber granules bonded by FLEXGROUND binder, 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 110 pounds (50 kg) of TPV to 22 pounds (10 kg) of binder.

* + - * 1. Minimum Thickness: 1/2 inch (12.7 mm).

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: UltraFlex; as manufactured and supplied by FlexGround, LLC.
			1. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. The cushion layer should be porous. Delete material options not required.

* + - * 1. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: As required for Critical Fall Height indicated.
				3. Thickness: \_\_\_\_\_.
			1. Wearing Surface:
				1. Material: 0.02 inches (0.5 mm) TPV or EPDM virgin colored rubber granules bonded by FLEXGROUND binder, 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 110 pounds (50 kg) of EPDM to 24.2 pounds (11 kg) of binder.

* + - * 1. Minimum Thickness: 1/2 inch (12.7 mm).

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: FlexGround Xtreme Play; as manufactured and supplied by FlexGround, LLC.
			1. Description: 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 shall 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: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. The cushion layer should be porous. Delete material options not required.

* + - * 1. Material: Mixture of black recycled SBR rubber buffings and a 100 percent solids moisture cured MDI polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: As required for Critical Fall Height indicated.
				3. Thickness: \_\_\_\_\_.
			1. Wearing Surface:
				1. Material: TPV or EPDM virgin color rubber granules mixed with an aromatic or aliphatic urethane binder.

Ratio: 110 pounds (50 kg) of TPV or EPDM to 22 pounds (10 kg) of binder.

* + - 1. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course layer rendering it non-porous.
				1. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
				2. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
				3. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
				4. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
			2. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
			3. Color Seal: Water-based composite color seal applied (2 coat) at300square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface. Slip resistance materials may be added on second coat.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Depending on height and diameter desired, shotcrete or concrete form may be required. Warranty may be different than surrounding surfacing. Additional maintenance may be required due to high use. Delete if not required.

* + 1. Basis of Design: FlexPlay; as manufactured and supplied by FlexGround, LLC.
			1. Description: Playground mounds added to play surface. Capable of being placed in fall zone areas.

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

* + - 1. Mound Configuration:

\*\* NOTE TO SPECIFIER \*\* Provide height and diameter required. Mounds over 5 feet (1524 mm) high require keyway cuts every 5 feet (1524 mm). Maximum slope is 30 percent. Delete options not required.

* + - * 1. Height: As indicated on Drawings.
				2. Height: \_\_\_\_\_.
				3. Diameter: As indicated on Drawings.
				4. Diameter: \_\_\_\_\_.
			1. Tunnel Configuration:

\*\* NOTE TO SPECIFIER \*\* Provide length and diameter required. Delete options not required.

* + - * 1. Length: As indicated on Drawings.
				2. Length: \_\_\_\_\_.
				3. Diameter: As indicated on Drawings.
				4. Diameter: \_\_\_\_\_.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: FlexBond; as manufactured and supplied by FlexGround, LLC.
			1. Description: A poured in place single-layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by surfacing manufacturer.
			3. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			4. High wear areas such as under swings and slides require a TPV 1/2:" insert.
			5. Surfacing: Porous layer.
				1. Material: 100 percent post-consumer waste tire containing no metal or lead.

SBR Rubber: +4 SBR mulch buffings.

Sieve, 0.49 inch (12.5 mm): 0 percent.

Sieve, 20: 98 to 100 percent.

Pan: 0 to 2 percent.

* + - * 1. Rubber to Urethane Ratio: 20 percent.

\*\* NOTE TO SPECIFIER \*\* Minimum thickness is inches (51 mm). Delete thickness options not required.

* + - * 1. Thickness: 2 inches (51 mm).
				2. Thickness: As indicated on Drawings.
				3. Thickness: As required for Critical Fall Height indicated.
				4. Thickness: \_\_\_\_\_.

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

* + - 1. Color: To be selected by Architect.
			2. Minimal fluff off (granulation) is to be expected.
			3. Color: As indicated on Drawings.
			4. Color: \_\_\_\_\_.
		1. Basis of Design: EnduraFlex with Xtreme Surfacing; as manufactured and supplied by FlexGround, LLC.
			1. Description: A dual durometer poured in place system with a wearing layer upper membrane, grouted and sealed in designated high-wear areas, and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) thick chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. Delete material options not required.

* + - * 1. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: As required for Critical Fall Height indicated.
				3. Thickness: \_\_\_\_\_.
			1. Wearing Surface:
				1. Material: TPV virgin colored rubber granules bonded mixed with a 100 percent solids moisture cured MDI polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - 1. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course layer rendering it non-porous.
				1. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
				2. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
				3. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
				4. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
			2. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
			3. Color Seal: Water-based composite color seal applied (2 coat) at 300 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: Multicoat Acrylic Krete Kote; as supplied by FlexGround, LLC.
			1. Description: Super bonding, flexible synthetic resin modified cementitious coating which forms a durable, anti-skid, weather, and chemical resistant surface over properly prepared substrates.
			2. Properties:
				1. Weatherometer, ASTM G23: 2000 hrs. - Passed.
				2. Compressive Strength, ASTM C109: 2595 psi at 45 days air cured.
				3. Flexural Strength - Modulus of Rupture, ASTM D790: 770psi.
				4. Tensile Strength, ASTM C190: 457 psi.
				5. Bond Strength - Flatwise Tension, ASTM C297: 225 psi.
				6. Abrasion Test, ASTM D1242: 39 mil loss 1000cyc-1000gms
				7. Salt Spray - 300 hours, ASTM B117: Passed.
				8. Water Vapor Transmission, ASTM E96: 8.5 Perms.
				9. Freeze Thaw 50-Cycle, ASTM C67: Passed.
				10. Impact Resistance, MIL-D-3134F: Passed.
				11. Flame Spread, ASTM E84: Class A.
			3. Accessory Materials:
				1. Color Sealer: Acrathane ColorSeal, a series of high quality water based modified resins that provide a high quality, durable seal on masonry, cementitious, and other building substrates. Colors are factory blended to insure uniformity.
				2. Clear Sealer: Multicoat Acrathane ClearSeal, a water base material.
				3. Concrete Repair: Multicoat Speed Mix 2000, a fast setting, resin modified, hydraulic cement. Used by itself for most types of concrete repair such as leveling, filling cavities and cracks. Can be used interior or exterior, vertical, horizontal, or overhead.
				4. Crack Repair: Multicoat Speed Bond Crack Repair System, a unique two component water based polyurethane material. Used to repair cracks, holes, and depressions prior to the application of various Multicoat Systems.
				5. Water: Potable.

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

* 1. SYNTHETIC TURF
		1. Performance Requirements:
			1. Standards Compliance: ASTM D624, ASTM D2859, ASTM E303, ASTM F1292, ASTM F1951, ASTM C1028, and ASTM D412.
		2. Basis of Design: FlexGrass Premier Turf; as manufactured and supplied by FlexGround, LLC.
			1. Description: A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) thick chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. Delete material options not required.

* + - * 1. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: As required for Critical Fall Height indicated.
				3. Thickness: \_\_\_\_\_.
			1. Synthetic Turf:
				1. Material: 1-1/2 inch (38 mm) monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch.

Material shall have built-in antimicrobial protection to reduce odor and inhibit growth of bacteria, mold, and mildew.

Tufted with a minimum of 60 ounces (1.7 kg) of yarn per square yard (0.84 square meters).

* + - * 1. Backing:

Primary Backing: Woven polypropylene.

Secondary Backing: Polyurethane.

* + - * 1. Finish Coating: 22 ounces (0.62 kg) per square yard (0.84 square meters).
				2. Machine Gauge: 1/2 inch (13 mm).
				3. Tufted Pile Height: 1-1/2 inches (38 mm).
				4. Total Fabric Weight: Minimum 88 ounces (2.5 kg) of yarn per square yard (0.84 square meters).
				5. Roll Width: 15 feet (4572 mm).
				6. Perforations: Ensure drainage greater than 30 inches (762 mm) per hour.
				7. Lines, Numbers, and Markings: Permanently inlaid.
			1. Color: Green to simulate natural grass as closely as possible.
			2. No nails or fastener to be used in installation, adhesive only.
			3. Infill System: Non-expansive, engineered, coated, clean, dust free, and specially sized silicon dioxide beads.
			4. Edging System: Minimum 2 inch (51 mm) thick by 6 inch (152 mm) wide rubber or concrete glue down strip. Existing cushion layer is acceptable as a glue down surface.

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

* 1. SURFACE REPAIR AND MAINTENANCE

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: FlexGrout; as manufactured and supplied by FlexGround, LLC.
			1. Description: A poured in place grout system with a penetrating membrane.
			2. Material: Thixotropic thermoplastic paste applied over wear course layer rendering it non-porous.

\*\* NOTE TO SPECIFIER \*\* Delete spread rate options not required.

* + - * 1. Spread Rate: 30 square feet (2.78 square meters) per gallon (3.8 L).
				2. Spread Rate: \_\_\_\_\_.
				3. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
				4. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
				5. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
				6. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
			1. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
			2. Color Seal: Water-based composite color seal applied (2 coats) at 300 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: FlexCoat; as manufactured and supplied by FlexGround, LLC.
			1. Description: Aliphatic urethane coating designed to be low viscosity for optimal penetrating abilities and prevents premature granulation.
			2. Uses: Rebinds the rubber granules, improving the useful life of rubber safety surfacing and rejuvenates surface color.
		2. Basis of Design: FlexFix; as manufactured and supplied by FlexGround, LLC.
			1. Description: Quickly and easily repairs minor and major damage. Cuts are made at 45 degrees.
		3. Basis of Design: FlexTop; as manufactured and supplied by FlexGround, LLC.
			1. Performance Requirements: Meets or exceeds ASTM F1292 for impact attenuation.
			2. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer.
			3. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			4. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) thick chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. Delete material options not required.

* + - * 1. Material: Mixture of recycled rubber and a 100 percent solids moisture cured MDI polyurethane binder with correct amount of urethane for impact attenuation and longevity.
				2. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
			1. Wearing Surface:
				1. Material: 0.04 to 0.12 inches (1 to 3 mm) virgin peroxide cured EPDM rubber granules, or 0.04 to 0.16 inches (1 to 4 mm) TPV virgin colored rubber mixed with 100 percent solids moisture cured polyurethane binder.

Ratio: 110 pounds (50 kg) of EPDM or TPV to 22 pounds (10 kg) of binder.

* + - * 1. Minimum Thickness: 1/2 inch (12.7 mm).

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: FlexTop with Xtreme; as manufactured and supplied by FlexGround, LLC.
			1. Performance Requirements: Meets or exceeds ASTM F1292 for impact attenuation.
			2. Description: A dual durometer poured in place system with a wearing layer upper membrane, grouted and sealed in designated high-wear areas, and an underlying impact attenuation cushion layer.
			3. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			4. Cushion Layer: Porous layer.

\*\* NOTE TO SPECIFIER \*\* As an upgrade, a 5/8 inch (16 mm) thick chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM is available as a partial or full replacement. Delete material options not required.

* + - * 1. Material: Mixture of black recycled SBR rubber buffings and a 100 percent solids moisture cured MDI polyurethane binder.

Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.

* + - * 1. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
			1. Wearing Surface:
				1. Material: TPV virgin colored rubber mixed with an aromatic or aliphatic cured urethane binder.

Ratio: 110 pounds (50 kg) of TPV to 22 pounds (10 kg) of binder.

* + - * 1. Minimum Thickness: 1/2 inch (12.7 mm).
			1. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course in designated high-wear areas.
				1. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
				2. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
				3. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
				4. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
			2. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
			3. Color Seal: Water-based composite color seal applied (2 coats) at 300.3 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.

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

* 1. AQUATICS SURFACING

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: PolySplash; as manufactured and supplied by FlexGround, LLC.
			1. Performance Requirements:
				1. Standards Compliance: AS/NZS 4586, ASTM G21, ASTM D4060, ASTM D1171, and ASTM D2859.
			2. Description: 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.
			3. Applications:

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

* + - * 1. Shower surrounds.
				2. Restrooms.
				3. Pool decks.
				4. Pool interiors.
				5. Splash pads.
				6. Locker rooms.
				7. \_\_\_\_\_.
			1. Material Components:
				1. Part A: Liquid polymer.
				2. Part B: Catalyst.
				3. Part C: Poly dust.
				4. Vapor Barrier option as required
				5. Broadcast: TPV rubber granules, 0.02 to 0.6 inches (0.5 to 1.5 mm).

\*\* NOTE TO SPECIFIER \*\* Delete broadcast type options not required.

* + - 1. Broadcast Type: Single broadcast.
			2. Broadcast Type: Double broadcast.
			3. Sealer: Clear, chlorine and UV resistant sealer.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: KoolFlex, as manufactured and supplied by FlexGround, LLC.
			1. Description: A dual durometer poured in place system with a base layer membrane and a thermoplastic composite grout filling layer.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Base Surface: Thickness of base surface varies composed of 0.04 to 0.016 inches 1 to 0.4 mm coated SBR rubber granules with an elastomeric rubber compound and mixed with urethane binder.
				1. Ratio: 110 pounds (50 kg) of Coated SBR 20 pounds (9kg) of binder.
			4. Grout: Thermoplastic composite grout:
				1. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
				2. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
				3. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
				4. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
			5. Primer coat: Urethane primer with tinting color packs. One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
			6. Color Seal: Water-based composite color seal 2 coats applied at 300 square feet (27.9 square meters) per gallon (3.8 L) per coat and spread evenly to cover the entire surface.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: FlexGround Xtreme Water Play; as manufactured and supplied by FlexGround, LLC.
			1. Performance Requirements:
				1. Standards Compliance:

ASTM F1292.

Water play compliance standards.

* + - 1. Description: The finished surface shall be non-porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
			2. Features: Anti-microbial and non-porous.
			3. Primer: As recommended by Manufacturer.
			4. Cushion Layer: As recommended by Manufacturer.
			5. Wearing Surface:
				1. Material: TPV virgin colored rubber mixed with an aromatic or aliphatic cured urethane binder.

Ratio: 110 pounds (50 kg) of TPV to 22 pounds (10 kg) of binder.

* + - * 1. Minimum Thickness: 1/2 inch (12.7 mm).
			1. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course in designated high-wear areas.
			2. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course layer rendering it non-porous.
				1. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
				2. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
				3. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
				4. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
			3. Primer coat: Urethane primer with tinting color packs. One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
			4. Color Seal: Water-based composite color seal applied (2 coats) at square feet (27.9 per gallon per coat (3.8 L) and spread evenly to cover the entire surface.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.

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

* 1. TRAIL SURFACING
		1. Basis of Design: FlexTrail; as manufactured and supplied by FlexGround, LLC.
			1. Description: A single-pour poured in place system. The finished surface shall be porous and capable of being installed at varying thickness.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Single Pour Layer:
				1. Material: Mixture of 3/8 inch (9.5 mm) pea gravel, TPV, or EPDM colored rubber granules, black SBR rubber granules, and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of pea gravel with either one 55 pounds (25 kg) of colored rubber granules or one 55 pounds (25 kg) of black SBR rubber granules, and 12.4 pounds (5.62kg) of binder. 8 percent.

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

* + - * 1. Thickness: As indicated on Drawings.
				2. Thickness: \_\_\_\_\_.

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.

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

* 1. ATHLETICS SURFACING

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: CourtScapes; as manufactured and supplied by FlexGround, LLC. This product is ITF (International Tennis Federation) certified.
			1. Description: A single-pour poured in place system. The finished surface shall be porous and capable of being installed at varying thickness.
			2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
			3. Single Pour Layer:
				1. Material: Mixture of 3/8 inch (9.5 mm) pea gravel, TPV, or EPDM colored rubber granules, black SBR rubber granules, and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.

Ratio: 100 pounds (45 kg) of pea gravel, 55 pounds (25 kg) of colored rubber granules, 55 pounds (25 kg) of black SBR rubber granules, and 31.5 pounds (14.3 kg) of binder.

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

* + - * 1. Surface Prep: Prep surface as required by manufacture.
				2. Thickness: As indicated on Drawings.
				3. Thickness: Minimum 1/2 inch (13 mm).

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

* + - 1. Color: To be selected by Architect.
			2. Color: As indicated on Drawings.
			3. Color: \_\_\_\_\_.
		1. Basis of Design: SportFlex Standard; as supplied by FlexGround, LLC.

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

* + - 1. Concrete Primer: Two-component, 100 percent solids, solvent-free epoxy primer.
				1. Percent Solids by Weight: Minimum 98 percent.
				2. Weight: 9.01 pounds (4.09 kg) per gallon (3.8 L).
			2. Acrylic Resurfacer: Acrylic-based emulsion used for smoothing rough pavements.

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

* + - * 1. Coats: 1 coat.
				2. Coats: 2 coats.
				3. Percent Solids by Weight: Minimum 52 percent.
				4. Weight: 10.68 pounds (4.84 kg) per gallon (3.8 L).
			1. ColorCoat Concentrate Textured Batch Mixture: Pigmented wear-resistant acrylic emulsion.
				1. Coats: 2 coats.
				2. Percent Solids by Weight: Minimum 49 percent.
				3. Weight: 12.9 pounds (5.85 kg) per gallon (3.8 L).

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

* + - * 1. Color: To be selected by Architect.
				2. Color: As indicated on Drawings.
				3. Color: \_\_\_\_\_.
			1. ColorCoat Concentrate Finish Batch Mixture: Pigmented wear-resistant acrylic emulsion.
				1. Coats: 1 coat.
				2. Percent Solids by Weight: Minimum 49 percent.
				3. Weight: 9.47 to 9.52 pounds (4.30 to 4.32 kg) per gallon (3.8 L).

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

* + - * 1. Color: To be selected by Architect.
				2. Color: As indicated on Drawings.
				3. Color: \_\_\_\_\_.
			1. SportFlex Line Prime: Clear drying acrylic emulsion line primer.
				1. Coats: 1 coat.
				2. Percent Solids by Weight: 29 percent.
				3. Weight: 8.9 pounds (4.04 kg) per gallon (3.8 L).
			2. SportFlex Textured White Line Paint: Factory textured, wear-resistant acrylic emulsion line marking paint.

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

* + - * 1. Coats: 1 coat.
				2. Coats: 2 coats.
				3. Percent Solids by Weight: 67 percent.
				4. Weight: 11.4 pounds (5.17 kg) per gallon (3.8 L).
		1. Basis of Design: SportFlex Plus; as supplied by FlexGround, LLC.
			1. Crack Repair: Super bonding cementitious compound.
			2. Acrylic Resurfacer: Acrylic-based emulsion used for smoothing rough pavements.

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

* + - * 1. Coats: 1 coat.
				2. Coats: 2 coats.
				3. Percent Solids by Weight: Minimum 52 percent.
				4. Weight: 10.68 pounds (4.84 kg) per gallon (3.8 L).
			1. ColorCoat Concentrate Textured Batch Mixture: Pigmented wear-resistant acrylic emulsion.
				1. Coats: 2 coats.
				2. Percent Solids by Weight: Minimum 49 percent.
				3. Weight: 12.9 pounds (5.85 kg) per gallon (3.8 L).
		1. Basis of Design: SportFlex Ultra; as manufactured and supplied by FlexGround, LLC.
			1. Crack Repair: Super bonding cementitious compound.
			2. Surface Layer: 1/2 to 3/4 inch (13 to 19 mm) layer of TPV or EPDM colored granules, hand troweled over prepared surface with aromatic or aliphatic urethane.

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

* + - * 1. Color: To be selected by Architect.
				2. Color: As indicated on Drawings.
				3. Color: \_\_\_\_\_.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until 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.
			1. Install in thickness and layers indicated.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturer's recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION