



Section 32 18 16.13

PLAYGROUND PROTECTIVE SURFACING

ENDURAFLEX POURED IN PLACE SAFETY SURFACING

MANUFACTURERS SPECIFICATIONS

This document provides the specifications for a poured in place safety surfacing system composed of a wearing layer upper membrane, and an underlying impact attenuation cushion layer.

There may be variations in the final specifications as required by the Client.

PART 1 - GENERAL

1.01 WORK INCLUDED

Provide all labor, materials, and tools necessary for the complete installation of a poured in place safety surfacing system as outlined in these specifications. The system should consist of, but not necessarily be limited to, the following:

- A. Section includes: Resilient playground surfacing poured in place system.
- B. Related work: Playground equipment and resilient playground surfacing sub base.
- C. Quality Assurance: Manufacturer should have manufactured and installed playground poured in place safety surfaces for a minimum of 5 years, and meet current ASTM F-1292 Test Criteria. The installation of the poured in place product should be completed by FLEXGROUND. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.02 SUBMITTALS

Prospective manufacturers and/or installers of the poured in place safety surfacing system should be required to comply with the following:

- A. The manufacturer must be experienced in the manufacturing of a poured in place safety surfacing system and provide references of five (5) specific installations in the last three (3) years.
- B. The installer must provide competent workmen skilled in this specific type of poured in place safety surfacing system installation. The designated supervisory personnel on the project must be competent in the installation of this material, including mixing, spreading and compacting the materials correctly.
- C. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground Equipment.
- D. IPEMA Certification specific to poured in place safety surfacing.
- E. IPEMA certification specific to ½" layer of 1-4mm TPV over cushion layer.

Note: IPEMA certification for .5-1.5mm TPV or EPDM granules not acceptable.

- F. Manufacturer should provide written instructions for recommended maintenance practices.
- G. Manufacturer should submit color samples for customer verification. Color samples shall be 6" x 6" of ½" top wear course layer with aromatic or aliphatic binder – per client selection or specification; or 8 oz clear plastic jars with specified colored granules. Sample submittal format per client preference.

PART 2 - PRODUCTS

2.01 DEFINITIONS

- A. 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 stated height(s).
- B. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
- C. TPV: Rosehill TPV® proprietary formula, consisting of a vulcanized (fully cross-linked) premium colored rubber granule.
- D. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene.
- E. Chunk Rubber: 5/8" granules: This rubber is pre-consumer, post-industrial, reclaimed rubber, granulated through a 5/8" screen and contains less than 2% dust.
- F. SBR homogeneous rubber pellets derived from rubber powder reclaimed from end of use tires. Genan Pellets 3.8/35.

2.02 ASTM TESTING STANDARDS – FlexGround Standard meets or exceeds all required ASTM standards below.

- A. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- B. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- C. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- D. ASTM F1292 – Standard specification for impact attenuation of surface systems under and around playground equipment.
- E. ASTM F1951 – Standard specification for determination of accessibility of surface systems under and around playground equipment.
- F. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
- G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

2.03 WARRANTY AND MAINTENANCE

The bidder and/or poured in place safety surfacing manufacturer must provide the following:

- A. The poured in place safety surfacing manufacturer should provide a warranty to the owner that
- B. covers defects in materials and workmanship of the rubber for a period of FIVE (5) years from the date of Substantial Completion.
- C. The manufacturer's warranty should include general wear and tear. The warranty should specifically exclude vandalism, high heel punctures, acts of war or acts of nature beyond the control of the owner or the manufacturer.
- D. 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.
- E. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the ENDURAFLEX safety surface.
- F. All warranties, expressed or implied, are contingent upon the following: 1. Installation being
- G. performed by FLEXGROUND, 2: Owner, at owner's expense, having a Flexcoat performed at 2 year intervals from date of substantial completion, and 3. Full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.

2.04 ENDURAFLEX MATERIAL

The ENDURAFLEX poured in place safety surfacing system should be in accordance with the following:

- A. A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
- B. FLEXGROUND primer is a 100% solids urethane primer/sealer. It is designed with low viscosity and penetrating abilities making this an ideal priming urethane.
- C. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture-cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness. As an upgrade, a 5/8" chunk rubber derived only from high-quality pre-consumer recycled rubber containing EPDM is available. The cushion layer should be porous.
- D. The ENDURAFLEX wearing surface should be manufactured from 1-4mm Thermoplastic Vulcanized (TPV) virgin colored rubber granules bonded by FLEXGROUND binder, 100% solids moisture-cured aliphatic or aromatic Polyurethane binder (110 pounds of TPV to 22 pounds of binder), and applied to a minimum thickness of 1/2" (12.7 mm) over the cushion layer.
- E. The system color should be selected from Manufacturer's Color Chart by owner prior to bid.

PART 3 – SITE SEPARATION AND BASE

The ENDURAFLEX site preparation and base should be in accordance with the following:

- A. The sub-base will have a slope of 2%.
- B. The base aggregate should consist of a minimum of four inches (4") of $\frac{3}{4}$ " Class 2 aggregate compacted to 95%. Finish slope of porous aggregate should be 2% from the centerline of the area to the perimeter, and the grade should not vary more than a quarter inch ($\frac{1}{4}$ ") in ten feet (10').
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.
- I. Hard Base Construction: For concrete surfaces, shot blast, acid etch or power scarify as required to obtain optimal bond of the Cushion Layer to the concrete. Remove sufficient material to provide a sound surface, free of glaze, efflorescence, or form release agents. Remove grease, oil, and other penetrating contaminants.
- J. For concrete or asphalt surface that is not enclosed (i.e. a curb to curb pour), the concrete shall have keyway cuts 1.5" wide by 1.5" deep so that the system can be bull nosed down into the notch area.

Note: Any modifications to the recommended subgrade installation procedures must be approved in writing by all involved parties—including manufacturer representative, the playground owner, site contractor, and architect. Failure to obtain written approval from all parties prior to implementing changes will result in the warranty being voided.

PART 4 – EXECUTION AND INSTALLATION

The poured in place safety surfacing installer shall strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements shall be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

4.01 PRIMER

- A. A urethane primer should be applied to concrete, asphalt, or wood surfaces at a rate of 200-250 square feet per gallon. The entire area does not need to be primed at once, instead, prime about 700 square feet at a time in immediate advance of rubber installation. This procedure should be continued until all areas are complete.

- B. The urethane primer should be applied to any playground equipment that will be surrounded by the poured in place safety surfacing system.

4.02 CUSHION LAYER

- A. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
- B. The cushion layer comprised of SBR buffings with strands that may vary from 0.5 mm – 2.0 mm in thickness by 3.0 mm – 20 mm in length or SBR granular rubber (5-9 Mesh) using sieve analysis ASTM D5644 with a fiber content of .1% or less mixed in. The SBR shall be mixed with the aromatic moisture cure polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
- C. The cushion layer comprised of Chunk Rubber. This rubber is pre-consumer, post-industrial, reclaimed rubber, granulated through a 5/8" screen and contains less than 2% dust. This shall be mixed with aromatic binder at a rate of 4-8% of total weight of material.
- D. SBR homogeneous rubber pellets derived from rubber powder reclaimed from end of use tires. Genan Pellets 3.8/35. This shall be mixed with aromatic binder at a rate of 4-8% of total weight of material.
- E. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.
- F. Note: The mixing ratios and material specifications outlined above for the cushion layer components—including SBR buffings, granular rubber, chunk rubber, and homogeneous rubber pellets—are provided as general guidelines based on manufacturer recommendations and standard industry practices. However, due to the variability in product type, product size, and environmental conditions such as temperature fluctuations during installation, it is acknowledged that adjustments may be necessary to ensure optimal performance and safety.

4.03 WEAR COURSE LAYER

- A. The wear course layer should be mixed with 1-4mm TPV granules and urethane binder at a rate of 20% of the total weight of the materials so the granules are covered thoroughly and evenly.
- B. The wear course layer mix should be spread and troweled to a depth of a half inch (½").
- C. Application in cooler temperatures require a minimum ambient temperature to be 40 degrees F. or above and rising during install and no more than a 35-degree temperature change from daytime to nighttime.
- D. Where seams are required due to color change, a step configuration with a 4" overlap will be constructed to maintain wear surface integrity.
- E. The finished texture shall be slip resistant, smooth, and even.
- F. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.

PART 5 – SITE (GENERAL)

- A. Trailer/ Large truck access will be necessary for the installation. In the case that access for trailer/truck



- B. is not available the owner or general contractor will be responsible for transporting material to the job site.
- C. Crew is responsible for protecting the surface only while present on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the product's cure period after completion of the install.
- D. Crew will leave site clean and shall remove all trash and debris.
- E. Owner/General Contractor shall provide a dumpster for all waste and trash.