

BONDED RUBBER SAFETY SURFACING

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: Unitary 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 Rubber Designs. 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 of the materials, and 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 bonded poured in place rubber safety surfacing.
- E. Manufacturer should provide written instructions for recommended maintenance practices.
- F. Provide certificates of compliance for FireFly Sports Testing certification verifying manufacturer's certification of conformance to EPA 1633, EN71-3, ASTM F3496-Details:
 - a. PFAS Testing EPA Method 1633 (Revision A – December 2024): Required PFAS test for all solid materials. Note: Must be used in place of outdated water-extraction PFAS methods.
 - b. Element Migration (Heavy Metals) EN 71 3 – Migration of Certain Elements Testing for 19 restricted elements under simulated gastric conditions.
 - c. Polyaromatic Hydrocarbons (PAH) ASTM F3496 – PAH content in synthetic

turf infill and other surface materials as adapted.

1.03 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 height.
- 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. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene.

1.04 ASTM Testing Standards – Rubber Designs 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 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 – This standard replaces ASTM D2047
- G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.05 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 covers defects in materials and workmanship of the bonded rubber for a period of **THREE (3) years** from the date of Substantial Completion.
- B. 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.
- C. Proper drainage is critical to the longevity of the Bonded Rubber Poured in Place surfacing system. Inadequate drainage will cause premature breakdown of the poured system in affected areas; and void the warranty.

- 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. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
- E. The installer should clean the jobsite of excess materials and, if necessary, backfill any excavation around the perimeter with earth or other appropriate fill material.
- F. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the bonded rubber safety surface.

PART 2 – BONDED RUBBER MATERIAL

The Bonded Rubber safety surfacing system should be in accordance with the following:

- A. A poured in place single-layer system. 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. Bonded Rubber Surfacing: Minimum 1.5" thick using +4 SBR Mulch Buffings Sieves 12.5mm (0%) 20 Sieve (98-100%) and the pan (0-2%). Manufactured from 100% post-consumer waste tire containing no metal or lead. Rubber to urethane ratio shall be 20%.
- C. Trade name: Rubber Designs, LLC and subsidiaries.
- D. Colors: Red, Green, Beige, Blue, Brown and Black. Mixed combinations available.
- E. Rubber Designs primer is a 100% solids urethane primer/sealer. It is designed with low viscosity and penetrating abilities making this an ideal priming urethane.
- F. Critical Height: Per ASTM 1292.
- G. 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.
- H. The system color should be selected from Manufacturer's Color Chart by owner prior to bid.

PART 3 – SITE PREPARATION AND BASE

The Rubber Designs 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") free-draining stone, permeable aggregate base, or crushed rock 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 (¼") 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-grade 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 should be poured to the top of sublevel surface.
- G. The poured in place safety surfacing manufacturer 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. Stone Substrates: Verify that substrates are a minimum of 4" thick with proper drainage and compacted to 95%. Stone used shall be $\frac{3}{4}$ minus with screenings or suitable equivalent and shall vary no more than $\frac{1}{8}$ " within a 10 ft radius. Core drillings for equipment poles shall be filled flush to the top of the stone with concrete to prevent sinkholes after installation of Bonded Rubber surface.
- J. Hard Base Construction: For concrete surfaces, shot blast, acid etch or power scarify as required to obtain optimum bond of the Bonded Rubber 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.
- K. Asphalt Sub Base: New asphalt cure time requires 28 days. Once the new asphalt has cured, it must be pressure washed prior to the surfacing being installed. Existing asphalt should be cleaned with blower or pressure washer prior to install.
- L. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, sub grade and substrate conditions, drainage, and other conditions affecting performance of the Work. Drainage at the low end of the site is of the utmost importance. Any brick or concrete walls or curbs at the low end of the area to receive the play surface must minimally have drainage access via weep holes. Weep holes must extend a minimum of 2 inches above the top of the new concrete slab and a minimum of $\frac{1}{8}$ " below the top of the new concrete slab. The latter is necessary because the rubber surfacing system is porous and water will permeate (drain downward) to the concrete slab.
- M. General: Prepare substrates to receive surfacing products according to playground surface system manufacturer's written instructions. Verify that substrates are sound and without high spots, ridges, holes, and depressions.
- N. Substrates: Provide sound surface free of laitance, efflorescence, curing compounds, and other contaminants incompatible with playground surface system.
- O. Saw cut for terminal edges of playground surface systems as indicated.
- P. Treat control joints and other nonmoving substrate cracks to prevent telegraphing through playground surface system.

PART 4 - EXECUTION AND INSTALLATION

The poured in place safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should 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 Perimeter

- 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. 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 Single Layer Bonded Rubber

- A. The components of the bonded rubber surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
- B. The shredded rubber shall be mixed thoroughly with moisture cure polyurethane Aromatic binder at a rate of 20% of the total weight of the material so that the binder is evenly dispersed into the rubber.
- 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. The finished texture should be slip resistant, smooth and even.
- E. The poured in place bonded rubber surface should be allowed to cure for 24-72 hours or until dry to the touch.
- F. Testing Services: ASTM 1292 testing and inspection of completed applications of playground surface system may take place if desired and upon request. Costs of testing shall be at Owner/Contractor expense.

PART 5 - SITE (GENERAL)

- A. Trailer/ Large truck access will be necessary for the installation. In the case that access for trailer/truck is not available the owner or general contractor will be responsible for transporting material to the job site.
- B. Crew is responsible for protecting the surface only while on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the surfacing's curing period upon completion of the install.
- C. Crew will leave site clean and shall remove all trash and debris.
- D. Site contractor to provide dumpster for all waste and trash.