SECTION 02741
ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Standard Specifications for Public Works Construction (SSPWC), latest Edition.

C. Eastern Municipal Water District Standards and Specifications (EMWD), latest Edition.

D. Standard Drawings for Riverside County Flood Control & Water Conservation District (RCFC & WCD), latest Edition.

E. Standard Plans and Specifications for County of Riverside (CR), latest Edition.

F. Standard Specifications for Construction of Local Streets and Roads for California Department of Transportation (CALTRANS), latest Edition.

1.2 SUMMARY

A. Section Includes:

1. Hot-mix asphalt patching.
2. Hot-mix asphalt paving.
3. Hot-mix asphalt paving overlay.
4. Pavement-marking paint.

B. Related Sections:

1. Division 2 Section "Building Demolition" for demolition, removal, and recycling of existing asphalt pavements, and for geotextiles that are not embedded within courses of asphalt paving.
2. Division 2 Section "Earthwork" for aggregate subbase and base courses and for aggregate pavement shoulders.
3. Division 2 Section "Pavement Joint Sealants" for joint sealants and fillers at paving terminations.

1.3 DEFINITION

A. Asphalt Paving Terminology: Refer to SSPWC.

1.4 SUBMITTALS

A. Shall be submitted to the Architect for review and approval in accordance with 2-5.3 of the SSPWC. The Contractor shall allow **10** working days for review by the Architect.

1. Mix Designs.
2. Pavement-marking paint.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of applicable Sections of the SSPWC, EMWD, RCFC & WCD, CR and CALTRANS for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

B. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review condition of subgrade and preparatory work.
c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.
2. Tack Coat: Minimum surface temperature of 60 deg F.
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Shall conform to SubSection 310-5.6 of the SSPWC for private (on-site) and Sections 84 and 85 and applicable standards of CALTRANS for public (off-site).

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Shall be "Crushed Aggregate Base," in conformance with SubSection 200-2.2 of SSPWC.

2.2 ASPHALT MATERIALS

A. Asphalt: Asphalt base course shall be Type III-B-2 PG 64-10. Asphalt Surface Course shall be Type III-C-3 PG 64-10 in conformance with Section 203-6 of the SSPWC. The finish course of A.C. pavement shall be Class "C2"; however, underlying courses may be Class "B" or Class "C1". Asphalt concrete pavement shall be constructed in accordance with Section 302-5 of the SSPWC to the limits and grades shown on the plans and as specified by the Soils Report. The maximum thickness of any A.C. paving course (lift) shall not exceed 2 1/2".

B. Tack Coat: A tack coat shall be applied to all asphalt concrete and P.C.C. concrete surfaces to be joined by new A.C. pavement. Liquid asphalt used for tack coat shall be Grade SS-1h Emulsified Asphalt in conformance with Section 203-3 of the SSPWC. The rate of application of the tack coat shall be as designated in Subsection 302-5.3 of the SSPWC.

1. Payment for liquid asphalt as require on the plans and in these specifications is considered included in the price bid for the construction or installation of the item(s) that liquid asphalt is incidental or appurtenant.

C. Sealcoat (Fog Seal): All asphalt concrete pavement upon completion of placement and acceptance by the Agency representative and prior to any traffic paint being placed, shall have placed on it "Sealcoat - Asphalt-Based", in accordance with Section 203-9 of the SSPWC for private (on-site) and Asphaltic Emulsion and paint binder in accordance with Sections 37, 39 and 94 of CALTRANS for public (off-site).

1. Payment for sealcoat as require on the plans and in these specifications is considered included in the price bid for the construction or installation of the item(s) that seal coat is incidental or appurtenant.

D. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: Shall meet Section 200-1.5 of the SSPWC.

C. Paving Geotextile: Shall be in accordance with the Soils Report and Section 213-2 of the SSPWC.

D. Joint Sealant: Shall conform to Section 201-3 of the SSPWC.

E. Pavement-Marking Paint: Shall conform to SubSection 210-1.6 of the SSPWC for private (on-site) and Sections 84 and 85 of CALTRANS for public (off-site).

1. Color: As indicated.

F. Glass Beads: Shall conform to SubSection 210-1.6.5 of the SSPWC for private (on-site) and Sections 84 and 85 of CALTRANS for public (off-site).

G. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

2.4 MIXES

A. Hot-Mix Asphalt: Shall conform to Sections 203-6 and 302-5 of the SSPWC for private (on-site) and Sections 39 of CALTRANS for public (off-site).

B. Emulsified-Asphalt Slurry: Type 1 and shall conform to Section 302-4 of the SSPWC for private (on-site) and Sections 39 of CALTRANS for public (off-site).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction and then repeating in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Inspector, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 COLD MILLING

A. General: Shall conform to the plans and Section 302-5 of the SSPWC.

3.3 PATCHING

A. General: Shall conform to the plans and applicable Section of the SSPWC.

B. Tack Coat: Apply per SubSection 302-5.4 of the SSPWC.

3.4 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

3.5 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Prime Coat: Apply per SubSection 302-5.3 of the SSPWC.

D. Tack Coat: Apply per SubSection 302-5.4 of the SSPWC.

3.6 PAVING GEOTEXTILE INSTALLATION

A. General: Shall be in accordance with the Soils Report, Section 213-1 of the SSPWC and according to manufacturer's written instructions

1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.

3.7 HOT-MIX ASPHALT PLACING

A. General: Shall be placed per Section 302-5 of the SSPWC.

3.8 JOINTS

A. General: Shall conform to Section 302-5 of the SSPWC.

3.9 COMPACTION

A. General: Shall conform to Section 302-5 of the SSPWC.

B. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

C. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

D. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

E. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.10 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.11 SURFACE TREATMENTS

A. Slurry Seals: Apply per Section 302-4 of the SSPWC.

3.12 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Sweep and clean surface to eliminate loose material and dust.

C. Apply paint per Section 310-5.6 of the SSPWC for private (on-site) and Section 84 and applicable standards of CALTRANS.

3.13 WHEEL STOPS

A. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.14 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to applicable Sections of the SSPWC.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.15 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow milled materials to accumulate on-site.

END OF SECTION 02741

SECTION 02764
PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Standard Specifications for Public Works Construction (SSPWC), latest Edition.

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within cement concrete pavement.
2. Joints between cement concrete and asphalt pavement.

B. Related Sections include the following:

1. Division 2 Section "Hot-Mix Asphalt Paving" for constructing joints between concrete and asphalt pavement.
2. Division 2 Section "Cement Concrete Pavement" for constructing joints in concrete pavement.
3. Division 7 Section "Joint Sealants" for sealing nontraffic and traffic joints in locations not specified in this Section.

1.3 SUBMITTALS

A. Shall be submitted to the Architect for review and approval in accordance with 2-5.3 of the SSPWC. The Contractor shall allow 10 working days for review by the Architect.

B. Product Data: For each joint-sealant product indicated.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing of current sealant products within a 36-month period preceding the Notice to Proceed with the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 for testing indicated, as documented according to ASTM E 548.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet or covered with frost.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: Match adjacent concrete.

2.3 JOINT SEALANTS

A. Joint sealants shall conform to Section 201-3 of the SSPWC.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Shall conform to Section 201-3 of the SSPWC and manufacturer recommendations.

2.5 PRIMERS

A. Primers shall conform to Section 201-3 of the SSPWC and manufacturer recommendations..

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 02764

SECTION 02791
PLAYGROUND SAFETY SURFACING

PART 1 – GENERAL

1.1 SCOPE

a. Provide and install poured-in-place synthetic safety surfacing as shown and specified for playground surfaces.

1.2 RELATED SECTIONS

a. Section 02750 – Concrete Paving

b. Section 02880 – Playground

c. Section 03300 – Cast-in-Place Concrete

1.3 REFERENCES

The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only.

a. American Society for Testing and Materials (ASTM)

ASTMC136 Sieve Analysis of Fine and Coarse Aggregates
ASTM D412 Standard Test Method Vulcanized Rubber and Thermal Plastic Rubbers and Thermal Plastic Elastomers – Tension
ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D1682 Breaking Load and Elongation of Textile Fabrics
ASTM D2047 Standard Test Method for Static coefficient of Friction of Polish – Coated Floor Surfaces as Measured by the James Machine
ASTM D2240 Rubber Property—Durometer Hardness
ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
ASTM D3776 Mass per Unit Area (Weight) of Woven Fabric
ASTM D4491 Water Permeability of Textiles by Permeability
ASTMD 4533 Trapezoid Tearing Strength of Geotextiles
ASTMD 4632 Grab Breaking Load and Elongation of Geotextiles
ASTM D 5199 (Measuring Nominal Thickness of Geotextiles and Geomembranes
ASTM F 1292 (1995) Impact Attenuation of Surface Systems Under and Around Playground Equipment
ASTM F 1487 (1995) Playground Equipment for Public Use

b. Code of Federal Regulations (CFR)

CFR 28 Part 36 (1991) Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, Final Rule

c. U.S. Consumer Product Safety Commission (CPSC)

CPSC (1991) Handbook for Public Playground Safety, U.S. Consumer Product Safety Commission, Washington, D.C. 20207, 301-504-0494

1.4 PERFORMANCE REQUIREMENTS

A. Safety

Safety surfacing within playground equipment use zones shall meet or exceed the performance requirements of CPSC and ASTM F 1292 that a surface yield both a peak deceleration of no more than 200g, and a Head Injury Criteria (HIC) value of no more than 1,000g, for a head-first fall from the highest accessible portion of play equipment being installed. The highest accessible portion of playground equipment shall be as specified in Section 02880 Playground Equipment.

The Contractor is responsible for obtaining a determination (Certificate of Compliance) from the safety surfacing manufacturer of the product depth required to meet performance requirements for all play equipment.

For the existing equipment play area, the contractor is responsible for contacting the existing play equipment manufacturer to determine the depth of the synthetic safety surfacing required to meet all requirements cited above.

B. Accessibility

Safety surfaces intended to serve as accessible paths of travel for persons with disabilities shall be firm, stable and slip resistant and shall meet the requirements of FEDSTD 795, 28 CFR Part 36 ASTM F 1487, 1292.

1.5 SUBMITTALS

For synthetic safety surface:

a. Submit supplier's descriptive data and installation instructions, including cleaning and preventive maintenance instructions.

b. Submit shop drawings showing depth of the safety surfacing system, including depths of material, sub-base materials, hardware, and drainage.

c. Submit a list of materials and components to be installed as part of the system, by weight and/or volume and recommended coverage, including manufacturer's name, shipment date, storage requirements, and precautions, and that shall state chemical composition and test results to which material has been subjected in compliance with these Specifications.

d. Certificates of Compliance

The impact attenuation performance of the synthetic safety surfacing proposed for installation shall be documented by certificates of compliance, as specified in paragraphs 1.04, A. An official authorized to certify on behalf of the synthetic safety surfacing and manufactured wood product manufacturer shall sign a statement attesting that the surfacing meets the requirements of ASTM F 1292 for a head-first fall from the highest accessible portion of installed play equipment. The impact attenuating qualities of the surfacing system shall not be diminished in the surface areas covering hardware. Testing of product shall include tests conducted over hardware. The statement shall be dated after the award of the Contract, shall state the Contractor's name and address, and

shall name the project and location. The statement shall also provide the name, address, and telephone number of the testing company, the date of the test, and the test results.

e. Manufacturer's Certification of Installation

The authorized manufacturer's representative shall certify upon completion of the installation that the safety surfacing has been installed in accordance with manufacturer's instructions and complies with all specifications.

f. A Certificate of Insurance shall be provided by manufacturers of synthetic safety surfacing, covering both product and general liability, of not less than $1,000,000. The issuing underwriter shall be AA rated.

g. Supplier must provide a $10 million product liability insurance certificate with project owner named as certificate holder, prior to delivery.

h. Submit a sample of each type of synthetic safety surfacing, minimum size 150 mm by 150 mm (6" by 6"), of the color specified, proposed for this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

a. Materials and equipment shall be delivered and stored, if necessary, in accordance with the manufacturer's recommendations, in an area as directed by the County.

1.7 SITE CONDITIONS

a. Synthetic safety surfacing shall be installed on dry subsurfaces. Temperatures and weather conditions shall be as recommended by the manufacturer, with no prospect of rain within the initial drying period.

1.8 SEQUENCING AND SCHEDULING

a. Safety surfacing shall be installed after the playground equipment is installed. The installation shall be coordinated with playground equipment and site element installation.

1.9 WARRANTY

a. Safety surfacing shall maintain required impact attenuation characteristics and be guaranteed against defects in workmanship or materials for a period of seven (7) years, after final acceptance by the County of Riverside

PART 2 – PRODUCTS

2.1 SYNTHETIC SAFETY SURFACING

a. Synthetic safety surfacing shall be a poured-in-place system, consisting of an impact attenuating substrate and a wear surface bonded to produce a uniform material installed on compacted aggregate base.

b. Impact Attenuating Substrate

Substrate shall consist of shredded styrene butadiene rubber (SBR) adhered with a 100% solids polyurethane binder to form a resilient, porous material. Strands of SBR may vary from 0.5 mm to 2 mm in thickness, by 3 mm to 20 mm in length. Foam rubber shall not be permitted in substrate. Binder shall be not less than 12%, or more than 16%, of the total weight of rubber, and shall provide 100% coating of the particles. The

substrate shall be compatible with the wear surface, shall be mixed and poured-in-place, and shall meet requirements herein for impact attenuation.

c. Wear Surface

Wear surface shall be a durable, weather-resistant, ultraviolet stable, water permeable material, which shall be the topcoat of a poured-in-place system. The wear surface shall meet ASTM D 2047 for minimum 0.8 coefficient of friction. Wear surface shall consist of ethylene propylene diene monomer (EPDM) particles adhered with a polyurethane binder formulated to produce an even, uniform surface. EPDM particles shall meet requirements of ASTM D 412 for tensile strength and elongation, ASTM D 2240 (Shore A) hardness of 50-70, not less than 25% rubber hydrocarbons. EPDM shall be peroxide or sulfur cured. Size of rubber particles shall be not less than 1 mm nor greater than 3 mm across. Binder shall be not less than 16% nor greater than 20% of total weight of rubber used in the wear surface, and shall provide 100% coating of the particles. Thickness of wear surface shall be a minimum 13 mm (1/2"). The wear surface shall be porous.

d. Binder

Binder for synthetic surfacing shall be nontoxic, weather-resistant, ultraviolet stable, non-hardening, retaining impact-attenuating qualities, and shall be 100% solids polyurethane, methylene diphenel isocyanate (MDI), or as recommended by the manufacturer. No toluene diphenel isocyanate (TDI) shall be used. Weight of polyurethane shall be no less than 1.02 kg/l (8.5 lb/gal), or more than 1.14 kg/l (9.5 lb/gal). Binder shall be alaphatic type only. Coloring pigments, if used, shall be inorganic oxides.

e. Color
Specific colors samples to be cast and to be submitted at least twice and approved by the County of Riverside before installation. Colors will be mixtures of color granules - (no black) for each color.

See Drawings for color schedule - locations and number of different colors.

2.2 AGGREGATE BASE ROCK

a. Aggregate base rock for synthetic surfacing shall be 20 mm (3/4") minus sharp crushed rock conforming to the following grading requirement:

SIEVE SIZE	PERCENT PASSING
25 mm (1")	100 percent
20 mm (3/4")	90-100 percent
10 mm (3/8")	55-75 percent
6 mm (1/4") or #10	40-60 percent

Fraction Pass 6 mm (1/4")
Where a tolerance range is set forth in the above grading requirements, the midpoint of the tolerance range is the target value and the product shall conform as closely as realistically possible to this target value. The purpose of the tolerance range is only to permit the occasional minor variations from the target value that are, for practical reasons, unavoidable.

b. Thickness

The minimum thickness of aggregate base rock shall be 100 mm (4") or as required by t he manufacturer.

c. Compaction

Compaction shall be 95% or shall meet manufacturer's requirements.

2.3 GEOTEXTILE FABRIC

a. Geotextile fabric shall be a non-woven polypropylene sheet or a 100% polyester sheet, meeting the following requirements:

Weight:	0.085 kg/m2 (3.0 oz/sy)	ASTM D 3776
Tensile strength:	40 kg (90 lbs)	ASTM D 1682
Elongation at break:	60% (percent)	ASTM D 1682
Permeability:	2 mm/sec (2/25"/sec)	

PART 3 – EXECUTION

3.1 PREPARATION

a. The contractor is responsible to coordinate the sequence of construction around playground safety surface work and related construction improvements.

b. Finished Grade

Finished elevations of adjacent areas shall be as indicated on the Drawings and the safety surfacing manufacturer's directions. The appropriate subgrade elevation shall be as established for the particular safety surfacing to be installed. The subsurface shall be installed in a true, even plane, and sloped to drain. Subsurface irregularities shall be corrected.

c. Synthetic Safety Surfacing

Subsurface shall be compacted aggregate, and meet requirements of the safety surface manufacturer. Tolerance of aggregate subsurfaces shall be within 13 mm (1/2") in 3 m (10'-0"). Aggregate subsurfaces shall be fully compacted to 95%.

d. Curing of Concrete

Prior to installation of synthetic surfacing, verify that concrete subsurfaces have fully cured a minimum of thirty (30) days (or as recommended by manufacturer) and that all concrete curing compounds and other deleterious substances that might adversely affect adhesion have been removed. Surface shall be clean and dry.

e. Drainage

The Contractor shall verify that subsurface drainage, including piped drainage systems, if required, has been installed to provide positive drainage.

3.2 SYNTHETIC SAFETY SURFACING INSTALLATION

a. Poured-in-Place System

Components of the poured-in-place safety surface system shall be mixed mechanically on site in accordance with manufacturer's recommendations to ensure a uniform distribution of binder. Hand-mixing shall not be allowed. Installation of poured-in-place surfacing shall be seamless and completely bonded to subsurface. Material shall cover all foundations and fill around all elements penetrating the surface.

b. Geotextile Fabric

When poured-in-place safety surfacing is installed over a compacted aggregate base, geotextile fabric shall be installed as shown on Drawings. Fabric shall cover the entire area to receive safety surface, and be lapped a minimum 100 mm (4") at seams. Seams shall be adhered in accordance with manufacturer's recommendations.

c. Poured-in-Place Substrate

The substrate layer of poured-in-place surfacing material shall be installed in one continuous pour on the same day.

d. Poured-in-Place Wear Surface

Wearing surface shall be bonded to substrate. Apply adhesive to substrate in small quantities so that wearing surface can be applied before adhesive dries. Surface shall be hand troweled to a smooth, even finish. Except where wearing surface is composed of different color patterns, pour shall be continuous and seamless. Where seams are required due to color change, adjacent color shall be placed as soon as possible, before initial pour has cured. The edge of initial pour shall be coated with adhesive and wearing surface mixture immediately applied.

e. Thickness

1. Construction methods, such as use of measured screeds 1 mm (1/16") thicker than the required surfacing depth, shall be employed to ensure full depth of specified surfacing material is installed.

2. Surfacing system thickness throughout the playground equipment use zone shall be as required to meet the impact attenuation requirements for a head-first fall from the highest accessible portion of installed play equipment. For the purpose of this specification for these installations, the highest accessible portion is determined to be eight feet (8'), equivalent to the top of the guardrail on a 4' high platform, plus a ten-inch (10") safety margin. The contractor shall verify that there are no higher accessible designated play surfaces, as specified in ASTM 1487. If equipment with higher accessible points is installed, safety surface thickness shall be increased accordingly.

f. Clean-up

Do not allow adhesives on adjacent surfaces. Immediately clean up spills or excess adhesive.

g. Protection

The synthetic safety surfacing shall be allowed to fully cure in accordance with manufacturer's instructions. The surface shall be protected from all traffic during the curing period for forty-eight (48) hours or as instructed by the manufacturer.

3.3 MANUFACTURER'S SERVICES

a. Services of a manufacturer's representative, or manufacturer's certified or authorized installer, who is experienced in installation of the specified playground safety surface, shall be provided. The representative shall supervise or inspect the installation to ensure that the safety surfacing meets the impact attenuation requirements as specified herein.

b. The manufacturer's representative shall certify that, regardless of the installer, the installation complies with the manufacturer's instructions and specifications, as specified in paragraph 1.4.1.

END OF SECTION- 02791