

TECHNICAL SPECIFICATION

A. SITE PREPARATION

1. **RELATED DOCUMENTS:** Drawings and general provisions of the Contract apply to this Section.
2. **SUMMARY:** This work shall include removal and replacement of running track synthetic surfacing and related asphalt crack repair as shown on the PLAN.
3. **DEFINITIONS:** Remove: Remove and legally dispose of items except those indicated to be salvaged or to remain the Owner's property.
4. **MATERIALS OWNERSHIP:**
 - a. Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain the Owner's property, removed materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.
 - b. Historical items indicated remain the Owner's property. Carefully remove and salvage each item in a manner to prevent damage and deliver promptly to the Owner.
 - c. Historical items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to the Owner, which may be encountered during demolition, remain the Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to the Owner.
 - d. Cooperate with Owner's archaeologist or historical adviser.
5. **SUBMITTALS:** Landfill records for record purposes indicating receipt and acceptance of hazardous wastes, if any are discovered on-site, by a landfill facility licensed to accept hazardous wastes.
6. **PROJECT CONDITIONS:**
 - a. Items to be removed will be vacated and their use discontinued before start of Work.
 - b. Owner assumes no responsibility for actual condition of items to be removed or removed and replaced.
 - c. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - d. Storage or sale of removed items or materials on-site will not be permitted.
7. **SCHEDULING:** Arrange removal and removal and replacement schedules so as not to interfere with Owner's on-site operations.
8. **EXAMINATION:** Verify that utilities have been disconnected and capped. Survey existing conditions and correlate with requirements indicated to determine extent of removal or removal and replacement required. Inventory and record the condition of items to be removed and items to be removed and replaced.
9. **UTILITY SERVICES:** Maintain existing utilities indicated to remain in service and protect them against damage during removal operations
 - a. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.
 - i. Provide not less than 72 hours' notice to Owner if shutdown of service is required during changeover.
 - b. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving structures to be removed or removed and salvaged.
 - i. Owner will arrange to shut off indicated utilities when requested by Contractor.
10. **PREPARATION:** Conduct removal operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - a. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain.

Ensure safe passage of people around removal area.

- a. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
- b. Protect existing site improvements, appurtenances, and landscaping to remain.
- c. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

Removal and Replacement Items: Comply with the following:

- a. Clean removed items to be re-used of dirt and removal debris.
- b. Transport items to Owner's designated on-site storage area.
- c. Store items in a secure area until re-used.
- d. Protect items from damage during transport and storage.

11. EXPLOSIVES: Use of explosives will not be permitted.
12. POLLUTION CONTROLS: Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations. Do not create hazardous or objectionable conditions, such as ice, flooding, and pollution, when using water. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Clean adjacent buildings and improvements of dust, dirt, and debris caused by removal operations. Return adjacent areas to condition existing before start of removals
13. FILL AND SEAL NON-STRUCTURAL CRACK: Filling and sealing of cracks shall be paid for per linear foot of cracks filled and sealed, and as described below. This work shall be full compensation for furnishing all labor, materials, equipment, tools and incidentals necessary to complete the work. Non-structural cracks shall be cleaned and blown out and then filled with approved polyurethane sealant. This work shall only be applied to cracks marked in the field by the ENGINEER. Payment will not be made for cracks that are repaired that are not marked by the ENGINEER.
14. FILL AND SEAL STRUCTURAL CRACK: Filling and sealing of cracks shall be paid for per linear foot of cracks filled and sealed, and as described below. This work shall be full compensation for furnishing all labor, materials, equipment, tools and incidentals necessary to complete the work. Structural cracks shall be cleaned and blown out and the track surface adjacent to the crack cleaned. The crack shall then be filled with cold patch asphalt millings and then covered with a Petrotac membrane or approved equal. Petrotac membrane shall be a minimum 12" wide and applied per the manufacturers recommendations and installation guidelines This work shall only be applied to cracks marked in the field by the ENGINEER. Payment will not be made for cracks that are repaired that are not marked by the ENGINEER.
15. 2" DEPTH ASPHALT SURFACE LIFT REPLACEMENT/PATCH
 - a. At locations determined by and marked in the field by the ENGINEER, the contractor shall full depth sawcut the existing asphalt overlay to a neat vertical edge, remove and dispose of existing asphalt overlay, prepare existing asphalt surface, and install new asphalt pavement per City of Omaha Standard Specifications for Public Works Construction current edition. Payment for the work shall be at the unit price per square yard, and shall be full compensation for furnishing all labor, materials, equipment, tools and incidentals necessary to complete the work. Payment will not be made for asphalt that is replaced that is not marked by the ENGINEER. All hot-mix asphalt pavement shall be in accordance with the Chapter 6 (Asphalt Concrete Construction) of the City of Omaha "Standard Specifications for Public Works Construction," Current Edition and the City of Omaha Asphalt Standard Requirements, unless otherwise indicated.

Mix Type/Designation (Modified NDOR Designations)	SPR	SPR Fine	SPR Coarse	SPH	SPS	LC
RAP, % By Total Wt. Of Mix ⁴	25-35 max.	25-35 max.	25-35 max.	25 max.		
Coarse Aggregate Crushed Particle (NDOR T586 ¹)	Min. 83 %	Min. 83%	Min. 83 %	Min. 95/90% ²		
Uncompacted Void Content Of Fine Aggregate, AASHTO T304 ³	43.0% min.	43.0% min.	43.0% min.	45.0% min.	Not	Not
Flat And Elongated Pieces (5:1 Ratio)	10% max.	10% max.	N/A	10% max.	Used	Used
Sand Equivalent	45 min.	45 min.	45 min.	45 min.	At	At
Dust To Effective Binder Ratio	0.7 - 1.7	0.7 - 1.7	0.7 - 1.7	0.7 - 1.7	This	This
Mix Design Air Voids, %	Target 4.0	Target 4.0	Target 4.0	Target 4.0	Time	Time
Compaction Gyration N _{initial}	7	7	7	8		
Compaction Gyration N _{design}	65	65	65	95		
Compaction Gyration N _{maximum}	100	100	100	150		
Minimum Production Binder Content (% of Total Mix)	5.0 min.	5.5 min.	4.8 min.	5.1 min.		
Production Air Voids, %	2.0 – 4.0	2.0 – 4.0	2.0 – 4.0	3.0 – 5.0		
In-Place Compaction (% of G _{mm})	92.4 min.	92.4 min.	92.4 min.	92.4 min.		

1. Coarse aggregate angularity individual test tolerance during production -5% below min.
2. "85/80" denotes that 85% of the coarse aggregate has one or more fractured faces and 80% has two or more fractured faces
3. Fine aggregate angularity individual test tolerance during production -0.5% below minimum
4. Recycled Asphalt Pavement (RAP) must be from a certified or controlled source acceptable to the Engineer and shall be approved prior to use in the asphalt mix

Mix Type/Designation	SPR		SPR Fine		SPR Coarse		SPH		LC	SPS
% Passing	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
Sieve Designation	1"				100.0					
	3/4"	98.0	100.0		90.0	100.0	100.0			
	1/2"					90.0	90.0	100.0		
	3/8"	81.0	89.0	81.0	96.0			90.0		
	#4									
	#8	46.0	56.0	46.0	56.0	23.0	49.0	28.0	58.0	
	#16									
	#30									
	#50	12.0	21.0	12.0	21.0					
	#100									
	#200	4.0	9.0	4.0	9.0	2.0	8.0	2.0	10.0	

B. TRACK SURFACING WITH MARKINGS

1. RELATED DOCUMENTS: Drawings and general provisions of the Contract apply to this Section.
2. DESCRIPTION: Furnish all labor, materials, tools and equipment necessary to install a base mat, which is installed on a Portland cement concrete base and Asphaltic concrete base, as indicated on the Plans. The base mat shall consist of SBR Rubber and a polyurethane binder, and shall measure at least 13mm thick. The synthetic surfacing contractor shall satisfy all applicable product and performance requirements as set forth in this section of the project specifications. The installation of all new materials shall be performed in strict accordance with the manufacturer's written installation instructions.
3. CODES AND STANDARDS: Codes and standards shall follow the current guidelines set forth by the National Federation of State High School Associations (NFHS) and the American Sports Builders Association (ASBA) along with current material testing guidelines as published by the American Society for Testing and Materials (ASTM).
4. SUBMITTALS
 - a. Warranty
 - (1) The synthetic track surface manufacturer and installation contractor shall provide a joint warranty, specifically listing both parties, covering the materials and workmanship.
 - (2) The synthetic track surface Contractor shall submit with the bid package a specimen copy of its Manufacturer's Warranty which guarantees the synthetic track surface system against defects in materials, workmanship, and significant color fade and granule loss for a five (5) year period commencing with the date of Substantial Completion. The warranty shall exclude damage or defects caused by subsequent deterioration or improper construction or design of the subbase materials, vandalism, abuse, neglect, lack of maintenance, or acts of God. The warranty coverage shall not be prorated nor limited to the amount of the usage.
 - (3) The warranty submitted must have the following characteristics:
 - (a) Must provide full coverage for five (5) years from the date of Substantial Completion.
 - (b) Must warrant materials and workmanship.
 - (c) Must warrant that the materials installed meet or exceed the product specifications.
 - (d) Must have a provision to either make a cash refund or repair or replace such portions of the installed materials that are no longer serviceable to maintain a serviceable and playable surface.
 - (e) Must be a joint warranty covering both workmanship and all self-manufactured or procured materials.
 - (f) Guarantee the availability of replacement material for the synthetic track surface system installed for the full warranty period.
 - (g) Must be a third party insured warranty from an A-rated insurance company (rated by AM Best Company). Certificate of Insurance must be submitted with final warranty to OWNER.
5. QUALITY ASSURANCE
 - a. Manufacturer and Installer's Experience:
 1. The synthetic track surface installer and manufacturer shall have a regional presence and reputation.
 2. The synthetic track surface Contractor shall employ only qualified, experienced supervisors and technicians skilled in the installation of the proposed synthetic track system.
 - b. Prospective synthetic track surface Contractor bidders must meet the following criteria:
 1. Have proper state contractor's license at the time of bidding, in good standing, and never had a license revoked or suspended.
 2. Have an American Sports Builders Association (ASBA) Certified Track Builder (CTB) on staff.
 3. If there are known geometry issues with the track the CONTRACTOR shall not paint the track markings until the geometry issues have been corrected and approval from the OWNER/ENGINEER has been obtained.

4. Coordinate the application of the track stripping with the placement of the asphaltic concrete surfacing courses.
5. Marking of the track shall be completed by a member of the American Sports Builders Association (ASBA). The track surfacing contractor shall certify that the track markings are in accordance with the standards of the Track and Field and Cross Country Rule Book, Current Edition, National Federation Edition, as published by the National Federation of State High School Associations, except as modified by the requirements of OWNER, as outlined later in this Section and per the direction of school officials. This certification shall state that the accuracy for each event shall be such that the tolerances for each lane are within plus 1/2-inch to minus 0-inch from the theoretical distance. Two (2) copies of the required certification shall be provided to the OWNER.
6. **EXISTING CONDITIONS:** The surface on which the new synthetic track surface is to be placed is an asphaltic concrete (track oval) and Portland cement concrete base (high jump areas and runways). A concrete curb will run along the inside and outside perimeter of the track. The Contractor shall be responsible for any damage to the asphalt, concrete curb border or any other existing structures or vegetation during installation of the synthetic track system.
7. **SURFACE AREA:** See Plans for site layout. Contractor to verify all measurements prior to commencing synthetic track surfacing installation.
8. **UTILITIES:** Owner will supply necessary water, adequate lighting, and electricity for installation.
9. **PRODUCTS:**
 - a. Shall be a base mat polyurethane synthetic running track and shall measure at least 13mm thick. The base mat shall consist of two-component polyurethane and styrene butadiene rubber (SBR) granules. The top layer shall consist of a two-component system consisting of a single component MDI-based polyurethane binder, mixed with a polyurethane base color paste. **100% of the SBR rubber used on the project shall be derived from recycled Nebraska tires.** The track shall also have a structural spray wearing layer of permeable design. The structural spray shall consist of a two-component system consisting of a single component MDI-based polyurethane binder, mixed with a polyurethane base color paste
 - b. Approved Surface Installers
 - (1) Surface installer shall be one of the following (no substitutes):

1.	BEYNON	16 ALT RD	HUNT VALLEY MD	(410) 771-9473
	CALIFORNIA SPORTS			
2.	SURFACES	150 DASCUMB ROAD	ANDOVER MA	(330) 803-6513
3.	FISHER TRACKS	1192 235 ST	BOONE IA	(515) 432-3191
	HELLAS CONSTRUCTION			
4.	INC	12710 RESEARCH BLVD	AUSTIN TX	(512) 250-1960
5.	MIDWEST TENNIS & TRACK	22 S MAIN ST	DENISON IA	(712) 263-3554
6.	RENNER SPORTS SURFACES	775 CANOSA CT	DENVER CO	(303) 825-3435
 - c. System Components
 - (1) Rubber Granules (Base Mat)
 - (a) The SBR granules shall be processed and graded to 1-3 mm in size with less than 4% retained on a No. 50 sieve and containing no fiber or metal. No SBR granules larger than that specified will be accepted.
 - i. SBR ground rubber material shall be certified 100% State of Nebraska recycled tire SBR rubber granules.

- (2) Polyurethane Binding Agent (Base Mat)
 - (a) Shall consist of a single-component MDI-based urethane that is compatible with SBR or EPDM rubber granules.
 - (3) Wear Coat Rubber Granules (Structural Spray)
 - (a) Shall consist of synthetic pigmented EPDM rubber – chopped, processed, and graded to 0.5-1.5 mm in size. Color shall be **BLACK**.
 - (4) Polyurethane Binding Agent (Structural Spray)
 - (a) Shall consist of a two-component system consisting of a single component MDI-based polyurethane binder, mixed with a polyurethane base color paste. Color shall be **BLACK**.
 - (5) Line Marking Paint
 - (a) The line marking paint shall be polyurethane-based paint specifically manufactured to be compatible with polyurethane synthetic track surfaces.
 - (6) All material brought onto the project site or removed from the project site will be verified by the Engineer as to quantity and type of material. Material applied to the track shall at all times meet or exceed the material list provided at the time of bid.
- d. Physical Properties
- (1) The synthetic track oval, high jump areas and field event areas surface shall exhibit the following minimum performance standards:
 - (a) Thickness: $\geq 13\text{mm}$
 - (b) Force Reduction: 20-35%
 - (c) Modified Vertical Deformation: 0.6 – 1.8 mm
 - (d) Friction (TRRL Skid Resistance): ≥ 47
 - (e) Tensile Strength: $\geq 0.5\text{ Mpa}$
 - (f) Elongation at Break: $\geq 40\%$
 - (g) Color: Black
 - (h) Permeability: Permeable
 - e. Along with the Bid Documents, the proposed bidder shall include the product specification sheet for the track included in their Bid. The product specification sheet shall provide all material property tests with numeric results and associated ASTM references.
10. WARRANTY: Track striping shall be guaranteed to be usable and free of defects for a period of two (2) years following the date of Substantial Completion. Two (2) copies of the final completed and executed warranty shall be submitted to the OWNER OR ENGINEER through the GENERAL CONTRACTOR at completion of the work.
11. MATERIALS: Track Marker Paint: Paint for marking of the track shall be 100% acrylic emulsion type containing no alkyds, butadiene styrene, or vinyls and shall be thinned with water only. The paint shall be suitable for the application by brush, spray, or roller. The paint shall also be suitable for use over all types of bituminous surfaces.
12. MARKINGS:
- a. Coordination Meeting: Prior to beginning application of track marking, a meeting shall be held between the OWNER representative, the ENGINEER, and the GENERAL CONTRACTOR, to coordinate all details of the track marking process.
 - b. Equipment: All equipment for the work shall be subject to the approval of the ENGINEER, and shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, and such auxiliary handpainting equipment as may be necessary to satisfactorily complete the job.
 - c. Preparation of Surface: Allow asphalt to cure at least 14 days, or as recommended by the manufacturer of the paint. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material that would reduce the bond between the paint and the surface. The area

to be painted shall be thoroughly and completely cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance, and loose materials.

- d. Layout of Markings: CONTRACTOR shall mark radius points, points of curvature, common finish lines, and lane marking locations at the points of curvature and midpoints of curves. CONTRACTOR shall lay out check marks for lane lines on curves at 20-foot intervals. Prior to commencement of marking, CONTRACTOR shall submit calculations for the listed events in writing. The calculations shall indicate the applicable distance and/or angle from the point of curvature or radius point for hurdle marks, stagger start lines, and relay exchange zones.
- e. Events: Marking of the track surfacing, along with the appropriate colors, shall as shown on the Plans (coordinate markings required with events listed below and with meeting prior to painting with OWNER):

13. EXECUTION: The installation shall be performed in full compliance with the Plans and reviewed shop drawings.

Only factory-trained technicians skilled in the installation of polyurethane/rubber synthetic running track surface, working under the direct supervision of the approved product manufacturer/installer's supervisors, shall undertake the placement of the system.

The asphaltic concrete or Portland cement concrete surface to receive the synthetic track surface shall be inspected and certified by the manufacturer as ready for the installation of the synthetic track system and must be perfectly clean as installation commences and shall be maintained by the synthetic track surface Contractor in that condition throughout the process.

14. INSTALLATION:

a. Subbase

- (1) The track oval surface, i.e., asphalt substrate, shall not vary from planned cross slope by more than $\pm 0.1\%$ with a maximum lateral slope outside to inside of 1.2% and a maximum slope of 0.1% in any running direction. The finished asphalt shall not vary under a 10-foot straight edge more than 1/8 inch.
- (2) The Contractor shall not use any petroleum products while on the concrete high jump areas or asphalt track oval following the completion of the surface course construction. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out, sandblasting, or removing and replacing with new, keyed in asphalt or concrete. The minimum depth of any asphalt or concrete replacement shall be one inch. The curing time for the asphalt base is approximately 14 days. The curing time for concrete is approximately 14 days. However, it shall ultimately be the responsibility of the synthetic track surfacing Contractor to determine if the asphalt or concrete substrate has cured sufficiently prior to the application of polyurethane surfacing system.
- (3) It should be the responsibility of the asphalt-paving contractor to flood the surface immediately after the asphalt is capable of handling traffic, but within 24 hours. If, after 20 minutes of drying time, there are birdbaths evident, the Engineer, in conjunction with the surfacing contractor shall determine the method of correction.
- (4) It shall be the responsibility of the Contractor to determine if the asphalt or concrete substrate meets all design specifications, i.e. cross slopes, planarity, and specific project criteria. After all the above conditions are met, the synthetic track surfacing Contractor must, in writing, accept the planarity of the asphalt- or concrete- receiving base, before work can commence.
- (5) No chemical curing compounds shall be used on the Portland Cement Concrete - Alternate curing methods shall be used.

b. Cleaning: The area to be surfaced shall be clean and free of any loose or foreign substances prior to the commencement of the track surfacing installation. The surface shall be cleaned by the use of a power blower and high-pressure washer.

c. Base Mat: Synthetic track surfacing Contractor shall blend black crumb rubber and polyurethane binding agent in suitable mixer for 2-3 minutes. Spread blended material onto concrete base by using a mechanical tandem leveler with heated screed bar to obtain both smoothness and compaction. Mat will be laid bay to bay, limiting the length of each pass to avoid cold (cured) joints. Ensure a good joint back tack coating traverse joint from previous day's work at beginning of each day's work. Remove small irregularities with a light weight polyethylene or Teflon roller. Monitor relative humidity conditions and relative curing rates.

Restrict all traffic the base mat until curing is complete. Protect installed materials from damage due to foot and/or vehicular traffic and deleterious weather. Polyurethane content of the base mat is a minimum of 20% as determined by the overall weight of the rubber granules per mix.

The installation shall be performed in full compliance with the Plans, manufacturer's recommendations, and reviewed shop drawings.

- d. **Structural Spray:** After the base mat has properly cured, contractor shall furnish and apply (2) structural spray wearing coats. The structural spray wearing coat mixture ratio shall be 60% polyurethane binder to 40% 0.5mm-1.5mm EPDM rubber granules. The structural spray wearing coat shall be applied at a rate of 1.8 to 2 pounds per square yard per coat. (2) coats shall be applied resulting in a total weight of 3.6 to 4 pounds per square yard. Synthetic track surfacing Contractor shall lay down plastic or tarps protecting existing fence, bleachers, or other structures during the application of the structural spray wearing coat. Synthetic track surfacing Contractor shall not apply coating if winds exceed 10 mph, preventing overspray.
 - e. **Thickness:** The thickness of the synthetic surfacing system shall be a minimum of 13 mm. The total thickness of the structural spray wearing layer shall be between 1.0-3.0mm
 - f. **Equipment:** The components for both the base layer and the top layer shall be blended in a clean and dry, specifically designed, mixing machine with automatic proportioning controls to guarantee exact proportions of the polyols and isocyanates. No hand mixing or spray coating is utilized for the application.
 - g. **Line Markings:** Contractor shall refer to Plans and shall verify with the school district's Athletic Director for exact locations, size, shape and color of lines and markings before proceeding with markings and striping. Marking and striping shall conform to American Sports Builders Association (ASBA) standards. All line and event markings shall be applied by experienced personnel utilizing polyurethane-based paint compatible with the synthetic track surfacing. All marking dimensions by the Contractor shall be certified in accordance with the specifications issued by the National Federation of High Schools (NFHS). The Contractor shall supply the Owner with all necessary computations and drawings, as well as a letter of certification attesting to the accuracy of the markings. Any geometric errors or irregularities which prevent the Contractor from properly installing markings and striping shall be immediately brought to the attention of the Engineer.
15. **PROTECTION:** The Contractor shall cover all fences, pavement, bleachers, turf, inlets, etc. and shall take measures to prevent spillage or splatter unto curbs, sidewalks, synthetic turf, fences or other areas outside the limits of the surfacing and to insure neat, clean edges.
16. **CLEAN UP:** The synthetic track surface Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- All usable remnants of new material shall become the property of the Owner.
- The synthetic track surface Contractor shall keep the work areas clean and clear of debris throughout the project.
- Surfaces, recesses, enclosures, etc., shall be cleaned, as necessary, to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.
17. **FINAL SUBMITTALS:** **The Contractor shall provide the Owner written certification that 100% of the SBR rubber used on the project was derived from recycled Nebraska tires.**
- The synthetic track surfacing installation contractor shall provide to the Owner, a joint warranty covering both workmanship and all self-manufactured or procured materials.

