Invitation for Bid
AEPA IFB #020-A
NATURAL AND SYNTHETIC SURFACES FOR SPORT FIELDS, TRACKS, COURTS, PLAYGROUND AND LANDSCAPING APPLICATIONS

THIS BID REQUIRES A $25,000 BID BOND

Part B – Technical Specifications

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1. Scope of Bid

AEPA is seeking qualified, experienced contractor(s) who possess the necessary resources and capabilities to acquire, deliver and perform the required supplies, materials equipment and labor to all participating member states (up to 28) necessary to:

a. Respond to request from a number of different types of educational, governmental and public institutions seeking Natural and Synthetic Surfaces for Sport Fields, Tracks, Courts, Playground and Landscaping Applications.
b. These items will include but are not limited to: Natural or Synthetic Turf for Sport Fields, Running Tracks, Tennis and Basketball Courts, Synthetic Turf for Playground and Landscaping Surfaces.
c. Types of services may include, but are not limited to: Construction, Site Preparation, Installation, Engineering, Design, Surface Testing, Field Certification, Repair Services etc.
d. Each Category stands by its self and a bidder can either bid on one or more categories. The categories are:
    a. Category 1- Synthetic Turf for Sport Fields,
    b. Category 2 - Natural Turf for Sport Field,
    c. Category 3 - Running Track, Tennis and Athletic Courts
    d. Category 4 – Synthetic Turf for Playground, Pet, Commercial, Landscaping Applications

AEPA and Member Agencies prefer a single vendor with a comprehensive array of products. However, because of the unique nature of vehicle distribution, Member Agencies will consider multiple awards based on a national or regional basis. See 7.1.20 below for regions.

2. Type of Bid

This bid is considered a:

YES	NO	TYPE OF BID
X		**CATALOG:** A catalog bid is utilized when the products and/or services solicited are clearly identified with set and specific characteristics, attributes and configurations that are identifiable as a stand-alone single unit and can be listed and priced as a single unit with options that can be added to enhance and/or improve its operation and functionality. The Bidder offers a fixed discount(s) off retail price or prices in a Commercially Available Catalog. The discounts may be for the entire Commercially Available Catalog, for specific products, product lines, manufacturers or category of products as determined by the Bidder. See Pricing section for detailed information on Catalog Pricing.
X		**LINE ITEM:** A line-item bid is utilized when the products and services solicited cannot be identified or listed as a single unit; consists of a number of different variables and configurations, it is necessary to identify the specific project or application; the end product or solution is made of individually priced elements or components and the end product's or solution's cost is derived by the Vendor Partner specially prepared and providing a quote based on the project's terms, conditions and requirements. See Pricing section for detailed information on Line-Item Pricing.

3. Anticipated AEPA Member Agency Participation

State	Participate? Yes/No/ Undecided	Other States Member Sells In
California	Yes	AZ, NV
Colorado	Yes	
Connecticut	Yes	MA, ME, NH, NY, RI, VT
Florida	Yes	AL
Georgia	Yes	
Illinois	No	
Indiana	Yes	
Iowa	No	IL, SD
Kansas	Yes	OK
Kentucky	Yes	AL, LA, MS, NC, SC, TN, WV
Massachusetts	No	
Michigan	Yes	
Minnesota	Yes	SD
Missouri	Yes	AR, IL, LA, SD
Montana	Yes	ID
Nebraska	Yes	
New Jersey	Yes	
New Mexico	Yes	
North Dakota	Yes	
Ohio	Yes	
Oregon	Yes	
Pennsylvania	No	DE, HI, MD, NY
Texas	Yes	
Virginia	Yes	
Washington	Yes	AK, ID
West Virginia	Yes	
Wisconsin	Yes	
Wyoming	Yes	SD,UT
Total	24	

Please note that individual AEPA Member Agencies that have indicated that they intend to participate in any contract approved under this solicitation, does not guarantee or mean that the individual AEPA

Member Agency will enter into a contract with any AEPA approved Vendor Partner. Each AEPA Member Agency will make that determination after reviewing Vendor Partner responses and AEPA's recommendation for acceptance and bid award. The AEPA Member Agency's contracting decision shall be final.

4. Anticipated Volume

Natural and Synthetic Surfaces for Sport Fields, Tracks, Courts, Playground and Landscaping Applications is a currently held category for AEPA. The resulting bid will be an Indefinite Delivery, Indefinite Quantity (IDIQ) contract(s). AEPA Member Agencies estimate approximately $65 million in turf sales and $21.3 million in tracks and courts in the first contract term. AEPA Member Agencies anticipate that purchase volumes will increase over the course of contract years two (2) through four (4). This information is provided as an aid to Bidders in preparing responses only. It is not to be considered a guarantee of volume under this IFB. The successful Vendor Partner's discount and pricing schedule shall apply regardless of the volume of business under the contract.

5. Voluntary Pre-Bid Conference Call

AEPA will host a voluntary pre-bid conference call on Wednesday, August 14, 2019, for any interested Bidders or potential Bidders. The conference call times are set in the following schedule for each of the four contiguous United States time zones. No pre-registration will be required. Recording of the conference call will be posted on the AEPA Website.

Voluntary Pre-Bid Conference Call Schedule (All Categories)

IFB	Eastern	Central	Mountain	Pacific
020-A Natural and Synthetic Surfaces for Sport Fields, Tracks, Courts, Playground and Landscaping Applications	11:00 AM	10:00 AM	9:00 AM	8:00 AM
020-B Carpet & Resilient Flooring	11:30 AM	10:30 AM	9:30 AM	8:30 AM
020-C Digital Resources & Instructional Materials	12:00 PM	11:00 AM	10:00 AM	9:00 AM
020-D Facility Management Software	12:30 PM	11:30 AM	10:30 AM	9:30 AM
020-E Lawn & Groundskeeping Equipment, Supplies & Services	1:00 PM	12:00 PM	11:00 AM	10:00 AM
020-F Digital Display Solutions	1:30 PM	12:30 PM	11:30 AM	10:30 AM
020-G Vehicles – Cars, SUVs, Crossovers, Light Duty Trucks, Vans, Police and Public Safety	2:00 PM	1:00 PM	12:00 PM	11:00 AM

Join Zoom Meeting: https://zoom.us/j/770090798
Conference Call Number: +1 929 436 2866
Meeting ID: 770 090 798

6. Glossary of Terms and Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in specifications or other contract documents, they shall mean the recognized name of the organizations responsible for the standards and regulations in the following list. Names, telephone numbers, and websites are subject to change and are believed to be accurate and up-to-date as of the date of the contract documents.

Item	Description
6.1.1.	Base Materials: Materials that provide porosity and stability such as crushed aggregate or porous pavement.
6.1.2.	Denier: The weight in grams of 9,000 meters offiber
6.1.3.	Drainage System: A method of removing surface and subsurface moisture/water.
6.1.4.	Fiber: A specific form of fibrous textile material that has a length at least 100 times its

Item	Description
	diameter or width.
6.1.5.	Fiber Thickness: A measurement in microns (metric) or mils. (U.S.) of the thinnest cross section of a fiber.
6.1.6.	*G*-Max: A measurement of impact (shock absorption) in terms of gravity units as a ratio of deceleration.
6.1.7.	Infill: Loosely dispersed materials that are added to the synthetic turf system, typically sand, rubber, other suitable material, or a combination thereof.
6.1.8.	Knitted: A process in which the yarn fibers of the pile are tied to the backing which was simultaneously constructed by transforming continuous strands of multi-filaments into a series of interlocking loops, each row of such loops hanging from the row immediately preceding it.
6.1.9.	Water Permeability: The rate at which water flows through a surface or system cross-section or components of the cross-section.
6.1.10.	Planarity: Uniformity of the surface as compared to certain fixed predetermined points or prescribed slopes.
6.1.11.	Primary Backing System: A single or multiple layers of woven or non-woven materials, into which the fiber is either tufted or knitted, to provide the initial construction of the synthetic turf.
6.1.12.	Secondary Backing System: A coating and/or woven or non-woven fabric layer(s) applied to the primary backing after the fiber pile has been tufted or knitted into place, which serves to enhance tuft bind and provide additional structural integrity.
6.1.13.	Shock Absorbing System: Component(s) that add resiliency to the system.
6.1.14.	Sub-grade: A stabilized foundation onto which the base materials and field systems are installed.
6.1.15.	Synthetic Pile Fiber: Grass-like blades made of synthetic materials.
6.1.16.	Synthetic Turf Systems: These systems are comprised of synthetic grass like surface piles, tufted, or knitted into a primary backing system to which a secondary backing system has been applied; with or without infill material (s); a shock absorbing system, and suitable base materials with an appropriate drainage system.
6.1.17.	Tufted: A process by which the fiber yarns that form the pile are inserted into a previously prepared blanket-like primary backing.
6.1.18.	Abbreviations that may be referenced in the specifications.
6.1.19.	Amateur Athletic Union (AAU)
6.1.20.	American Society for Testing and Materials (ASTM)
6.1.21.	Deutsches Institut für Normung (DIN)
6.1.22.	Federation of International Football Association (FIFA)
6.1.23.	International Amateur Athletic Federation (IAAF)
6.1.24.	National Collegiate Athletic Association (NCAA)
6.1.25.	Synthetic Turf Council (STC)
6.1.26.	American Sport Builder Association
6.1.27.	National Federation of State High School Associations (NFH)
6.1.28.	ASTM - Test method published by the American Society for Testing and Materials
6.1.29.	EN -Test method published by the European Standards Organization
6.1.30.	FIFA -Test method described in FIFA Handbook of Test Methods and Requirements for Artificial Turf Football Surfaces
6.1.31.	FIH - International Hockey Federation
6.1.32.	ASTM - Test method published by the American Society for Testing and Materials
6.1.33.	ASTM Standards lines 6.1.34 to 6.1.42
6.1.34.	ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort - These test methods cover laboratory compaction methods used to determine the relationship between molding water content and dry unit weight of soils

Item	Description
	(compaction curve) compacted in a 4- or 6-in. (101.6- or 152.4-mm) diameter mold with a 10.00-lbf. (44.48-N) rammer dropped from a height of 18.00 in. (457.2 mm) producing a compactive effort of 56 000 ft-lbf/ft3 (2700 kN-m/m3). Effort.
6.1.35.	ASTM F 1015-03(2009) - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces. This test method is applicable to both laboratory and field measurement of synthetic turf surfaces used for sports. Data obtained from the procedure of this test method are indicative of the relative abrasiveness of fabric or carpet type synthetic playing surfaces.
6.1.36.	ASTM F 1162/F1162M-12 Standard Specification for Pole Vault Landing Systems. This specification covers minimum requirements of size, physical characteristics of materials, standard testing procedures, labeling, and identification of pole vault landing systems.
6.1.37.	ASTM F 1551-09 Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials. These test methods are used to identify physical property characteristics and comparison of the performance properties of synthetic turf systems or components for athletic and recreational uses, or both.
6.1.38.	ASTM F 1632-10 Standard Test Method for Particle Size Analysis and Sand Shape Grading of Golf Course Putting Green and Sports Field Rootzone Mixes - This test method covers the determination of particle size distribution of putting green and other sand-based root- zone mixes. Particles larger than 0.05 mm (retained on a No. 270 sieve) are determined by sieving. The silt and clay percentages are determined by a sedimentation process, using the pipet method. This procedure was developed for putting green rootzone mixes, those assumed to have sand contents of 80 % by weight or greater. Particle size analysis of soils may be performed by this test method or Test Method D 422. This test method also describes a qualitative evaluation of sand particle shape.
6.1.39.	ASTM F 1647-11 Standard Test Methods for Organic Matter Content of Putting Green and Sports Turf Root Zone Mixes - These test methods cover the determination of the percent organic matter of a putting green root zone mixture using a loss on ignition method or the Walkley Black method. These test methods are useful for quantifying the organic matter content of volume ratio mixed root zone mixes. Test Methods D 2974 is recommended for peat and other organic soils.
6.1.40.	ASTM F 1702-10 - Measuring Impact-Attenuation Characteristics of Natural Playing Surface Systems Using Lightweight Portable Apparatus. This test method is used to determine the impact-attenuation characteristics of natural turfgrass and soil playing surface systems with a lightweight portable apparatus. This test method can be used to compare the impact attenuation characteristics of natural playing surface systems, as well as assessing the effects of management practices on the impact attenuation characteristics. This test method also can be used to assess the compatibility of natural playing surfaces by recording g-max values or penetration of successive impacts, or both. This test method provides a procedure for assessing impact attenuation characteristics in the field, on both actual playing surfaces and research plots.
6.1.41.	ASTM F 1815-11 Standard Test Methods for Saturated Hydraulic Conductivity, Water Retention, Porosity, and Bulk Density of Putting Green and Sports Turf Root Zones - These test methods cover the measurements of saturated hydraulic conductivity, water retention, porosity (including distribution of capillary and air-filled porosity at a known soil suction), and bulk density on sand-based root zone mixes to be used for construction and topdressing of golf course putting greens including United States Golf Association (USGA) recommended greens, golf course tees, sand-based sports fields, or other highly trafficked turfgrass areas. These test methods are designed for sand-based mixes and are not intended for use with fine or medium textured soils, for example, sandy loams and loams.
6.1.42.	ASTM F 1936-10 Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field. This specification establishes an in situ test method and maximum impact attenuation value for all types of turf playing systems and for a number of sport specific field layouts. It also includes a protocol for determining test point locations on fields

Item	Description
	that are lined for multiple sports.
6.1.43.	ASTM F 1953-10 - Construction and Maintenance of Grass Tennis Courts. This standard outlines technique that are appropriate for the construction and maintenance of grass tennis courts. The standard provides guidance for the selection of soil materials and turfgrass species to be used.
6.1.44.	ASTM F 2000-10 Standard Guide for Fencing for Baseball and Softball Fields. This standard provides recommended minimum requirements for various types of fences used in softball and baseball ballfields and other sports facilities.
6.1.45.	ASTM F 2056-09 Standard Safety and Performance Specification for Soccer Goals. This standard outlines safety and performance requirements for soccer goals aimed at providing for safer use of soccer goals and reducing injuries and fatalities. Properties such as strength, stability, and weight are discussed.
6.1.46.	ASTM F 2060-11 Standard Guide for Maintaining Cool Season Turfgrasses on Athletic Fields - This guide covers the minimum requirements for maintaining cool season turfgrasses used for natural surface athletic fields. Practices covered include mowing, fertilization, irrigation, core cultivation, overseeding, and pest management.
6.1.47.	ASTM F 2107-08 Construction and Maintenance of Skinned Areas on Baseball and Softball Fields This standard covers technique for constructing and maintaining skinned areas on baseball and softball fields. The standard provides guidance for selecting suitable construction materials (soil, sand, etc.). Construction techniques are outlined along with minimum maintenance procedures such as scarification, irrigation, and the use of conditioners.
6.1.48.	ASTM F 2157-09 Standard Specification for Synthetic Surfaced Running Tracks. This specification establishes the minimum performance requirements and classification when tested in accordance with the procedures outlined within this specification. All documents referencing this specification must include classification required.
6.1.49.	ASTM F 2269-11 Standard Guide for Maintaining Warm Season Turfgrasses on Athletic Fields - This guide covers the minimum requirements for maintaining warm-season turfgrasses used for natural surface athletic fields. Practices covered include mowing, fertilization, irrigation, core cultivation, winter overseeding, pest management, and requirements for management of dormant turf winter overseeded with cool-season turf (see also Guide F 2060).
6.1.50.	ASTM F 2270-12 - Construction and Maintenance of Warning Track Areas on Sports Fields. This guide covers techniques that are appropriate for the construction and maintenance of warning track areas on sports fields. This guide provides guidance for the selection of materials, such as soil and sand for use in constructing or reconditioning warning track areas and for selection of management practices that will maintain a safe and functioning warning track. Although this guide has applications to all sports where a warning track surface may be required or desired, it has specific applications to baseball/softball.
6.1.51.	ASTM F 2396-11 Standard Guide for Construction of High-Performance Sand-Based Rootzones for Sports Fields - This guide covers techniques that are appropriate for the construction of high-performance sand-based rootzones for sports fields. This guide provides guidance for the selection of materials, including soil, sand, gravel, peat, and so forth, for use in designing and constructing sand-based sports turf rootzones.
6.1.52.	ASTM F 2569-11 Standard Test Method for Evaluating the Force Reduction Properties of Surfaces for Athletic Use. This test method covers the quantitative measurement and normalization of impact forces generated through a mechanical impact test on an athletic surface. The impact forces simulated in this test method are intended to represent those produced by lower extremities of an athlete during landing events on sport or athletic surfaces.
6.1.53.	ASTM F 2631-07 Standard Practice for Installation of Chain-Link Fence for Outdoor Sports Fields, Sports Courts, and Other Recreation Facilities. This practice is designed to be used for

Item	Description
	developing the chain-link fence, design, layout and installation for sports and recreation facilities such as sports fields and sports courts. It includes the internal fencing required for safety, separation of activities, security, crowd control, access, or other requirements.
6.1.54.	ASTM F 2650-07 Standard Terminology Relating to Impact Testing of Sports Surfaces and Equipment. This terminology covers terms related to impact test methods and impact attenuation specifications of sports equipment and surfaces.
6.1.55.	ASTM F 2651-10 Standard Terminology Relating to Soil and Turfgrass Characteristics of Natural Playing Surfaces. This terminology covers terms related to characteristics of soils and turfgrass for use in the development of standards and specifications for natural playing surfaces. Terms pertain to natural playing surfaces used for sports and may include those surfaces supporting the growth of turfgrass or bare soil playing surfaces that are constructed with natural materials.
6.1.56.	ASTM F 2673-08 Standard Safety Specification for Special Tip-Resistant Movable Soccer Goals. This specification covers safety requirements aimed at providing for safer use of soccer goals and reducing injuries and fatalities. It addresses the risk of accidental tip over or pull over of soccer goals. This specification applies only to movable goals whose inside measurements are 6½ to 8 ft (2 to 2.4 m) high and 18 to 24 ft (5.5 to 7.3 m) wide.
6.1.57.	ASTM F 2765-09 Standard Specification for Total Lead Content in Synthetic Turf Fibers. This specification applies to the maximum content of lead in fibers used in synthetic turf. This specification outlines a test method for sample preparation and a test method for analyzing the total lead content in synthetic turf fibers. This specification outlines guidelines for reporting total lead content in synthetic turf fibers. This specification applies only to synthetic turf fibers manufactured after Sept. 1, 2009.
6.1.58.	ASTM F 2898-11 Standard Test Method for Permeability of Synthetic Turf Sports Field Base Stone and Surface System by Non-Confined Area Flood Test Method. This test method can be used to determine in-place permeability of synthetic turf playing field systems, playing field systems with pad and/or premolded drainage boards, playing field systems with premolded panel base systems, porous and non-porous pavement systems in order to confirm compliance with design specifications and or evaluate existing as-built conditions. Synthetic turf field systems tend to drain under several flow regimes and this test method can provide a clear indication of actual in-field permeability flow rates with limited effect of lateral flow through base systems and no effect from head pressure.
6.1.59.	ASTM F 2949-12 Standard Specification for Pole Vault Box Collars. This specification covers minimum requirements of size, physical characteristics of materials, standard testing procedures, labeling and identification of pole vault box collars.
6.1.60.	ASTM F 355-16 Standard Test Method for Impact Attenuation of Playing Surface Systems, Other Protective Sport Systems, and Materials Used for Athletics, Recreation and Play - This test method measures the impact attenuation of surface systems and materials, specifically the peak impact acceleration ("impact shock") produced under prescribed impact conditions. This test method is applicable to natural and artificial surface systems intended to provide impact attenuation, including natural and artificial turf sports fields.
6.1.61.	ASTM F 969-11 Standard Practice for Construction of Chain-Link Tennis Court Fence. This standard covers proper techniques for constructing chain-link fencing around tennis courts.

7. Special Terms and Conditions

Item	Description
7.1.1.	A $25,000 dollar bid bond with the principal being the Bidder and the Association of Educational Purchasing Agencies being the Agency of Record. Acceptable bid bond forms are AIA Document A310-2010 Bid Bond or NASBP that includes the same language as the AIA Document A310-2010. You will need to identify on the Bid Bond what category or categories it will cover. The bid bond underwritten by a surety company licensed to issue bid bonds in the state of Nevada and said surety to be approved in federal circular 570 as published by

Item	Description
	the United States treasury department or the equivalent in cash or an irrevocable letter of credit from a FDIC financial institution. The bid security shall remain in force for one hundred twenty (120) days of bid opening. This is a requirement to submit a response.
7.1.2.	Bidder will endeavor to supply products that are made in the United States of America.
7.1.3.	If the Bidder intends to utilize independent agents/distributors, subcontractors and/or third-party agents to perform and/or provide any part of the products and services offered herein, the Vendor Partner must identify all providers and any and all associated costs with these providers.
7.1.4.	Optional services must be identified separately, and must include clear descriptions of proposed services.
7.1.5.	Contractor's License: Each of the AEPA states covered by this solicitation has its own state licensing qualifications, requirements and processes. The offeror is responsible for knowing each state's requirements and codes. For those states where licenses are required, a copy of the appropriate contractor licenses will need to be included in your response to this bid. If the Bidder is using one of its distributors or dealers a copies of their licenses shall be submitted to the AEPA Member Agency as part of their quote submission or upon request. All required licenses will be kept current and in compliance with the rules and regulations of each state's regulatory agency.
7.1.6.	Any contract awarded under any of the four (4) Categories of this bid is an indefinite-quantity contract with or without installation. All costs associated with preparing quotes/job orders/cost proposals shall be the responsibility of the contractor and must be based on a detailed scope of work and in compliance with one of the approved pricing methodologies.
7.1.7.	The standards and specifications provided and each Category are intended to establish minimum requirements and provide a general overview of the quality and type of products and services being requested.
7.1.8.	Any products and services offered are to meet or exceed all local and state building codes.
7.1.9.	The Bidder must be willing and able to demonstrate its past experience on at least five (5) acceptable project in each of the Categories that they will be submitting a bid within the past three (3) years.
7.1.10.	The Bidder must have the capacity to provide design, site inspection, site preparation and construction services for Categories that they will be submitting a bid. These services may be provided by the Bidder's own staff or by subcontractors contracted and supervised by the Bidder.
7.1.11.	The Bidder or its partner is responsible for ensuring that the design and construction drawings and manual clearly indicate, identify and communicate the products, services and testing requirements that must be provided to deal with site preparation, public utilities; sub-base-works, drainage systems; etc. for the Categories they are submitting a bid.
7.1.12.	For any project the proposer must comply with the Americans with Disabilities Act (ADA) (42 USC Section 12101 et seq.) and the Americans with Disabilities Act Architectural Guidelines (ADAAG), as well as the implementing requirements, 28 CFR Part 36, Federal Register, Vol. 56, No. 144, July 26, 1991, as amended.
7.1.13.	The Bidder must possess a knowledge and understanding of all federal, state, and local government codes, regulations and building codes dealing with the construction and installation of athletic running tracks or court surfaces.
7.1.14.	If any specifications is in conflict with the manufacturer specifications, the manufacturer specifications will prevail.
7.1.15.	The Bidder will provide at a minimum a written maintenance manual to the AEPA Member on completion of the project that includes day-to-day operating instructions, maintenance and repair methods.
7.1.16.	Provide required manufacturer's Product Data and Material Safety Data Sheets (MSDS) for

Item	Description
	products provided.
7.1.17.	The Bidder as part of its response to the Categories that a bid will be submitted, written specifications for each type of surface that it is offering.
7.1.18.	Delivery, Storage and Handling 1. Store packaged products in original, unopened packaging until ready for installation. 2. Store and dispose of solvent-based materials and materials used with solvent-based materials in accordance with requirements of AEPA Member State. 3. Protect all products from weather as specified by manufacturer instructions.
7.1.19.	All equipment will conform to the most recent Consumer Product Safety Commission (CPSC); American Society for Testing and Materials (ASTM) standards specifications; governing bodies' such as AAU, NCAA, NFHSA, and state requirements governing their level of athletic competition; and American Sports Builders Association (ASBA) guidelines and performance specification for synthetic surfaced athletics tracks, courts and fields; and American Disabilities Act (ADA) regulations.
7.1.20.	AEPA Vehicle Bid Regions: This solicitation may be awarded on a national or at a regional level. See regions below. AEPA reserves the right to modify the regions below after recommendation of award.
7.1.21.	Region 1: New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)
7.1.22.	Region 2: Mid-Atlantic (New Jersey, New York, Maryland, Delaware and Pennsylvania)
7.1.23.	Region 3: East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)
7.1.24.	Region 4: West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)
7.1.25.	Region 5: South Atlantic (Florida, Georgia, North Carolina, South Carolina, Virginia, District of Columbia, Kentucky and West Virginia)
7.1.26.	Region 6: East South Central (Alabama, Mississippi, Tennessee, Arkansas and Louisiana)
7.1.27.	Region 7: Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah Wyoming, Texas and Oklahoma)
7.1.28.	Region 8: Pacific (Alaska, California, Hawaii, Oregon and Washington)

8. Standard Specifications for all Categories

Item	Description
8.1.1.	General Requirements for all Categories
8.1.2.	All charges and components necessary for performance of a contract shall be clearly identified even if such are not specifically addressed in any paragraph or sub-paragraph or form that is a part of this request.
8.1.3.	Vendor Partner shall provide a Material Safety Data Sheet (MSDS) for all items sold, if required. A separate sheet shall be provided for each individual item when purchase is made.
8.1.4.	Provide technical and consulting services to AEPA Members relating to athletic, recreational, landscaping surface design, characteristics, and construction.
8.1.5.	Provide existing site inspection and investigation to identify soil conditions existing at the site in order to take into account the conditions found in the designing of athletic and recreational fields. The investigation shall include, but not be limited to: a. Stripping, placement of backfill and base construction in order to ensure the minimization of the risk of problems due to subsoil and subgrade conditions. b. Soil inspection for the existence of peat or other organic soils at the site. c. Inspection for uncontrolled fill materials or waste materials at the site. d. Inspection for expansive soils at the site. e. High ground water conditions or surface water retention areas (low area flooding). f. Special usage of the facility (i.e., using tennis courts, playgrounds, etc).

Item	Description
8.1.6.	Provide all labor, materials, equipment and drawings required to provide design services for a project cost proposal with a complete scope of work, including all products, services and with their associated costs. A preliminary construction time schedule shall be a part of the project proposal.
8.1.7.	Provide all labor, materials and equipment required to assess and evaluate existing facilities and develop and establish a plan of action for maintenance, repair and/or renovation of the existing athletic and recreational field to condition as required by the AEPA Member .
8.1.8.	Provide ongoing technical support and training services for AEPA Members' staff relating to the maintenance and operation of these types of facilities to ensure their good operational condition.
8.1.9.	Provide all labor, materials, equipment and drawings required to provide design services for a project cost proposal with a complete scope of work, including all products, services and surface specifications with their associated costs. A preliminary construction time schedule shall be a part of the project proposal.
8.1.10.	Provide all labor, materials, equipment, project drawings and construction documents necessary to install lines and markings required to complete the athletic or recreational field, running track, tennis and basketball court, etc. as identified within the project documents for the AEPA Member's project scope of work and documents.
8.1.11.	Provide all labor, materials and equipment required to assess and evaluate existing facilities and develop a plan of action for maintenance, repair and/or renovation of surfaces the existing as required by the AEPA Member .
8.1.12.	Provide ongoing technical support and training services for AEPA Members' staff relating to the maintenance and operation of these types of facilities to ensure their good operational condition.
8.1.13.	Assisting AEPA Members in assessing, evaluating and determining the safety and operational status of the various types of synthetic turf products. Providing AEPA Member with a complete and comprehensive report identifying areas of concern and equipment needing maintenance, repair and/or replacement.
8.1.14.	Assisting AEPA Members in developing a short-term action plan to remediate, resolve and/or remove any unsafe conditions and establish a long-term maintenance program for maintaining AEPA Member's turf installation in good working conditions.
8.1.15.	Upon request, assist the AEPA Members and its design professional in design of athletic and non-athletic surface or facilities for new and current public facilities.
8.1.16.	Provide AEPA Members with necessary construction services for demolition, site preparation and athletic and non-athletic surfaces and accessories.
8.1.17.	Provide AEPA Members with the necessary training and support services to allow their staff to conduct safety inspections, perform maintenance, install equipment, structures and fixtures according to manufacturer's specifications..
8.1.18.	All material shall be guaranteed to the extent that: 1. Installed in accordance and the manufacturer's specifications. 2. Will perform as specified per the manufacturer's specifications
8.1.19.	Project Site 1. The contractor shall hold AEPA Member harmless from damage from trespassing on property by others. 2. There shall be no dumping of construction debris or other material on AEPA Member's or Participating Entity's property. 3. Any material that requires special handling as dictated by federal or state law shall be removed and disposed by the contractor at the end of the project. 4. Project site to meet all OSHA requirements. 5. Provide pedestrian protection and warnings during construction which comply with local, Federal, and OSHA codes.

Item	Description
	6. Prior to erection of any kind, the Contractor shall grade, backfill, and otherwise prepare the job site to ensure safe working conditions. 7. Any grade or elevation situations which deviate from the approved plans and drawings shall be approved by the AEPA Member representative and the equipment manufacturer prior to installation. 8. Dumpster for trash and debris shall be provided by the Contractor.
8.1.20.	Utility Services 1. Cost for temporary utility services electrical, water, gas, etc., that is utilized during the construction process will be identified and agreed upon in writing by the AEPA Member. 2. Utility services (electrical, water, gas, etc.) utilized by the contractor to maintain a project office trailer, maintenance shop, storage facilities, security lighting, etc., will be the responsibility of the contractor and can only be transferred to the AEPA Member on written agreement between AEPA Member and Contractor. 3. All work will be in compliance with OSHA safety requirements and any additional applicable federal, state, or local fire and safety requirements. When specifications or scope of work will result in a violation of a code or result in an unsafe condition, the contractor must inform the AEPA Member representative of the situation. The contractor will not work that intentionally violates a fire, health, safety or UBC code or safety standard.

9. Product/Category Specific Specifications

Category 1 Synthetic Turf Category

Item	Description
9.1.1.	The standards and specifications provided below are intended to establish minimum requirements and provide a general overview of the quality and type of products and services being requested.
9.1.2.	Any products and services offered are to meet or exceed all local and state building codes.
9.1.3.	The products and services may include, but are not limited to, the following: 1. Provide technical and consulting services relating to athletic and recreational field surface design, characteristics, construction, and integration into the development of a new athletic or recreational facility. 2. Provide existing site inspection and investigation to identify soil conditions existing at the site in order to take into account the conditions found in the designing of athletic and recreational fields. The investigation shall include, but not be limited to: a. Stripping, placement of backfill and base construction in order to ensure the minimization of the risk of problems due to subsoil and subgrade conditions. b. Soil inspection for the existence of peat or other organic soils at the site. c. Inspection for uncontrolled fill materials or waste materials at the site. d. Inspection for expansive soils at the site. e. High ground water conditions or surface water retention areas (low area flooding).
9.1.4.	Provide ongoing technical support and training services for AEPA Member's staff relating to the maintenance and operation of these types of facilities to ensure their good operational condition.
9.1.5.	The synthetic turf surface should provide the performance characteristics, components, and construction that meet the needs of the declared use and/or functions.
9.1.6.	The synthetic turf system and all of its components should be resistant to moisture, rot, mildew, bacteria, fungus growth, ultraviolet ray degradation, non- toxic, not cause commonly known allergic reactions at all field locations, and meet AEPA Member local state and environmental requirements.
9.1.7.	Each synthetic turf system should be constructed to provide dimensional stability and resist

Item	Description
	damage from wear and tear during athletic and recreational usage.
9.1.8.	The standards and specifications provided below are intended to establish minimum requirements and provide a general overview of the quality and type of products and services being requested.
9.1.9.	Any products and services offered are to meet or exceed all local and state building codes.
9.1.10.	The products and services may include, but are not limited to, the following.
9.1.11.	Provide technical and consulting services relating to athletic and recreational field surface design, characteristics, construction, and integration into the development of a new athletic or recreational facility.
9.1.12.	Provide existing site inspection and investigation to identify soil conditions existing at the site in order to take into account the conditions found in the designing of athletic and recreational fields. The investigation shall include, but not be limited to:
9.1.13.	Stripping, placement of backfill and base construction in order to ensure the minimization of the risk of problems due to subsoil and subgrade conditions.
9.1.14.	Soil inspection for the existence of peat or other organic soils at the site.
9.1.15.	Inspection for uncontrolled fill materials or waste materials at the site.
9.1.16.	Inspection for expansive soils at the site.
9.1.17.	High ground water conditions or surface water retention areas (low area flooding).
9.1.18.	Provide all labor, materials, equipment and drawings required to provide design services for a project cost proposal with a complete scope of work, including all products, services and athletic and recreational field specifications with their associated costs. A preliminary construction time schedule shall be a part of the project proposal.
9.1.19.	Provide ongoing technical support and training services for AEPA Member's staff relating to the maintenance and operation of these types of facilities to ensure their good operational condition.
9.1.20.	The synthetic turf surface should provide the performance characteristics, components, and construction that meet the needs of the declared use and/or functions.
9.1.21.	The synthetic turf system and all of its components should be resistant to moisture, rot, mildew, bacteria, fungus growth, ultraviolet ray degradation, non- toxic, not cause commonly known allergic reactions at all field locations, and meet AEPA Member local state and environmental requirements.
9.1.22.	Each synthetic turf system should be constructed to provide dimensional stability and resist damage from wear and tear during athletic and recreational usage.
9.1.23.	The standards and specifications provided below are intended to establish minimum requirements and provide a general overview of the quality and type of products and services being requested.
9.1.24.	Any products and services offered are to meet or exceed all local and state building codes.
9.1.25.	The products and services may include, but are not limited to, the following.
9.1.26.	Provide technical and consulting services relating to athletic and recreational field surface design, characteristics, construction, and integration into the development of a new athletic or recreational facility.
9.1.27.	Provide existing site inspection and investigation to identify soil conditions existing at the site in order to take into account the conditions found in the designing of athletic and recreational fields. The investigation shall include, but not be limited to:
9.1.28.	Stripping, placement of backfill and base construction in order to ensure the minimization of the risk of problems due to subsoil and subgrade conditions.
9.1.29.	Soil inspection for the existence of peat or other organic soils at the site.
9.1.30.	Inspection for uncontrolled fill materials or waste materials at the site.
9.1.31.	Inspection for expansive soils at the site.
9.1.32.	High ground water conditions or surface water retention areas (low area flooding).
9.1.33.	Provide all labor, materials, equipment and drawings required to provide design services for

Item	Description
	a project cost proposal with a complete scope of work, including all products, services and athletic and recreational field specifications with their associated costs. A preliminary construction time schedule shall be a part of the project proposal.
9.1.34.	Any Project to Include: 1. Assess and determine existing site conditions and AEPA Member's expectations for the project. 2. Develop a proposed solution to conform to and meet the AEPA Member's expectations while considering and ensuring the following: a. The solution proposed is adequate and functional within the existing site conditions and will comply with all building codes. b. Provide labor, materials, equipment and supervision necessary to complete installation of synthetic turf, including the following: i. Site inspection and investigation. ii. Site preparation and sub-base. iii. Inspection and approval of sub-base. iv. Installation of proposed synthetic turf system with accessories, striping and equipment. c. Provide cost estimates and information relating to after-the-sale ongoing inspection and maintenance services to ensure proper
9.1.35.	Construction and installation services to prepare and install proposed synthetic turf system on the designated site in accordance with the shop drawings, striping plan and manufacturer's instructions and specifications.
9.1.36.	Warranty 1. Guarantee the usability and playability of the synthetic turf system for its intended uses for an eight (8) year period commencing with the date of substantial completion and acceptance by the AEPA Member. The warranty coverage shall not be limited to the amount of usage. 2. Warranties for the synthetic turf field systems should be clearly understood and may include the following: a. Acceptable uses for the field b. Fading c. Color match within specifications d. Excessive fiber wear e. Acceptable loss of pile height over time f. Wrinkling and panel movement g. Shock absorbency (g-max) h. Seam integrity i. Drainage j. Response time for required repairs/replacement k. Approved maintenance equipment l. Other items deemed relevant m. What conditions void a warranty 3. Warranty for all structures and components must be direct from the manufacturer and non-prorated for the entire term. 4. Extended warranties can be offered and provide a detailed description along with their associated costs. Include what is and is not covered. 5. G-Max Warranty should not-to-exceed STC's guideline for the life of the field warranty. The STC's guideline is that G-Max should be below 165 for the life of the field.
9.1.37.	Prior to order of materials, the contractor shall submit the following: 1. Sample warranty. 2. Seam layout of the field and striping plans.

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	3. Details on construction, especially any details that may deviate from plans and specifications.
9.1.38.	Prior to the beginning of installation, the manufacturer/installer of the synthetic turf shall inspect the sub-base and supply a Certificate of Sub-Base Acceptance for the purpose of obtaining manufacturer's warranty for the finished synthetic playing surface.
9.1.39.	Components for Synthetic Turf Systems to include but not limited to: 1. Synthetic Turf Types: There are several different types of synthetic turf available. They are distinguishable through the use of different fibers and different construction. Differentiated by construction are the tufted or the knitted synthetic turf systems. Both systems are comprised of synthetic fibers with primary and secondary backing systems and a resilient shock absorbing system. The shock absorbing system can consist of infill, a padding system, or a combination of both. 2. Fiber: Typically, the fiber used in synthetic turf is textured and/or non-textured polypropylene, polyester, polyethylene, nylon or other suitable performing hybrid or copolymer in tape form or monofilament. Minimum fiber sizes are 50 microns for polypropylene or polyester, 100 microns for tape form (slit-film) polyethylene, 140-300 for monofilament polyethylene (shape dependent) and 500 denier for nylon. Fiber sizes for hybrids or copolymer will comply with the most closely related fiber type. Ideally, all fibers should be of the same chemical composition, shape, and texture. Fibers should be compliant to ASTM guideline for total lead content. 3. Fiber: Typically, the fiber used in synthetic turf is textured and/or non-textured polypropylene, polyester, polyethylene, nylon or other suitable performing hybrid or copolymer in tape form or monofilament. Minimum fiber sizes are 50 microns for polypropylene or polyester, 100 microns for tape form (slit-film) polyethylene, 140-300 for monofilament polyethylene (shape dependent) and 500 denier for nylon. Fiber sizes for hybrids or copolymer will comply with the most closely related fiber type. Ideally, all fibers should be of the same chemical composition, shape, and texture. Fibers should be compliant to ASTM guideline for total lead content. 4. Primary Backing Systems Material: The primary backing materials are of a woven or non-woven fabric in one or more layers which are utilized in the tufting process, or of high strength polyester multi-filament fiber utilized in the knitting process. This backing material provides the initial dimensional stability for the system. 5. Secondary Backing Systems Material: The secondary backing materials are applied through a coating process with a single or multiple applications of one or various materials. 6. Perforations: Depending on the final construction of the turf system, the system may or may not be permeable to water. Perforations are typically required of fully coated system backings to provide adequate vertical drainage throughout the system. Some turf systems may allow for drainage without perforations by employing a process of partial coating or other system designs. Developments in coating systems have provided for lighter weight and aqueous permeable chemicals; however, the drainage criteria must be met. 7. Infill Materials: The most recent generation of synthetic turf systems utilizes a long pile height and needs to be supported with infill materials for directional stability and structural integrity, as well as resiliency. The infill materials commonly used are EDPM, TPE, natural cork, ground fibers from coconut shells, coated and non-coated silica sand, crumb and coated rubber, other suitable materials, or combinations of sand, rubber, or other suitable materials
9.1.40.	Synthetic Turf Performance 1. Traction: The surface should provide good traction in all types of weather with the use of conventional athletic type shoes applicable to the sports and/or activity specified. 2. Rotational Resistance: The surface should allow for twisting movements as is common

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	in athletic activities. Rotational resistance measures the ability of the user to perform twisting motions when in contact with the surface. 3. Slip Resistance Component: The system should enable a predictable range of movement between the user and the surface uniformly throughout. The surface should balance traction and slippage by way of the sliding coefficient. 4. Surface Abrasiveness: The field surface should have fibers and infill materials that minimize skin abrasions. 5. Impact Attenuation (g-max): The field surface should have the ability to adequately absorb player impact with the surface. The g-max and force reduction tests are two tests typically used. G-Max values may vary from location to location on a playing surface. Such variances shall be taken into account when setting maximum test values. A maximum, not-to-exceed limit should be specified for the life of the warranty. The STC's guideline is that g- max should be below 165 for the life of the field. 6. Surface Stability (vertical deformation): The surface should provide adequate stability so that the athlete can maintain body control to help prevent or properly control contact between athletes. This is an important consideration that should be balanced with the surfaces' ability to absorb impact. If the surface is too soft, the stability provided by the field may not be optimal for player movement and body control. 7. Ball-Surface Interaction: The synthetic turf playing field should provide consistent and predictable ball performance reaction characteristics. 8. Surface Uniformity: The synthetic turf playing field should be as level as practical. The synthetic surface shall provide a true and uniform playing surface throughout. 9. Ball Bounce: The synthetic turf field should provide a ball bounce as close to the optimal playing characteristics of the sport or sports. The published standards for the regulatory organizations as applicable for each sport should be referenced. 10. Ball Roll: The synthetic turf field should provide a ball roll as close to optimal playing characteristics of the intended sport or sports. The published standards for the regulatory organizations as may be applicable for each sport should be referenced. 11. Appearance: Unless otherwise dictated by design, the synthetic turf should have a consistent color, texture, and shade without significantly noticeable streaks or other irregularities when observed in any direction.
9.1.41.	Warranties for the synthetic turf field systems should include the following: 1. Acceptable uses for the field 2. Expected number of yearly hours of use of the field 3. Type of shoes used 4. Fading 5. Color match within specifications 6. Excessive fiber wear 7. Acceptable loss of pile height over time 8. Wrinkling and panel movement 9. Shock absorbency (g-max) 10. Seam integrity 11. Drainage 12. Response time for required repairs/replacement 13. Approved maintenance equipment 14. Other items deemed relevant
9.1.42.	Maintenance: 1. A regular schedule of maintenance should include but not limited to surface cleaning, debris removal, grooming, and infill replenishment, redistribution, and de-compaction. 2. The maintenance procedures and equipment, as specified by the synthetic turf manufacturer or Synthetic Turf Council's Guidelines for the Maintenance of Infilled

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	Synthetic Turf Surfaces, January 2013, for additional information.
9.1.43.	Other Considerations: 1. The synthetic turf supplier, unless the base is part of their scope of work, should perform an inspection of the field planarity base on to which the synthetic turf system is to be installed and to examine the finished surface for required compaction, water permeability, and grade tolerances. After any discrepancies between the required materials, application, and tolerance requirements noted have been corrected, the owner's representative (architect/engineer) should review and approve for compliance with documents. The acceptance of the base construction should be included in the certification for warranty validation. 2. Extra Materials: the synthetic turf manufacturer and installation contractor can provide extra sections of synthetic turf material for future repairs. If necessary, this should include materials for all colors used with any lines, markings, and logos. Quantities to be predetermined. This allows for materials from the same manufacturing run to be utilized for minor repairs.
9.1.44.	Drainage System Components 1. The system chosen will depend on the use of the field, climate, amount of rainfall, and other factors. 2. The drainage system may include but not limited to the synthetic turf, pad, base materials, and collector pipes that collect and remove storm water from the playing field. The design of the drainage system is dependent upon local conditions, climates, and site constraints. The Rational Method, Hydrograph Analysis, or Time Series Method may be used to determine the rainfall run- off that must be accommodated by collector pipes. 3. Site Conditions: Rainfall duration intensity curves can be developed from the National Weather Service Technical Paper TP-40 Rainfall Frequency Atlas for the United States or coordinated with the local weather statistics at the location of the project site. Otherwise, unless agreed to by the end user, the design storm frequency should be as required by local regulations. Where no local regulation exists, a minimum 5-year design storm frequency is recommended for playing fields at grade. For fields requiring pump stations, a more conservative design frequency that is compatible with the de- sign capacity of the pump station should be used. 4. Flow Time: The time interval for water to flow through the complete system to the collector pipes is based on permeability tests conducted in the laboratory for the design of the complete system. Flow through the base material can be enhanced by the use of composite drainage materials or lateral drain pipes that intercept the normal flow of water in the complete system and flow directly to the collector pipes. Flow rate into the lateral drainage sys- tem is dependent on the amount of available open space for water to enter the pipe. The geotextile cover on many composite drains can have varying effects on how fast water can enter the system over time. Care should be taken in evaluating these products and how the chosen base materials can affect water in-flow over time. 5. Collector Pipes: Collector pipes are typically perforated polyvinyl chloride (PVC) or polyethylene (PE) pipes. Size and type of perforations are dependent upon the size of the pipe. If perforations are larger than the smallest aggregate in the base material, then a geo-textile sock filter may be used to encapsulate the pipe care should be taken to ensure that the openings in the geo-textile fabric are compatible with the granular smaller components so that they do not block the pores and reduce water flow. A qualified civil or geotechnical engineer should be consulted to determine the suitability of using a product with a geo-textile sock in conjunction with the selected base materials as they can clog the sock over time and severely impede the performance of the system. Additionally, the compressive strength of various systems

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	can differ greatly, and care should be taken to keep construction traffic off the systems until enough stone has been placed and compacted. 6. The expected performance evaluation and the systems used should undergo an independent engineering analysis.
9.1.45.	Base Materials 1. The aggregate base on which the synthetic turf is installed provides a structurally sound foundation for field construction, and a media for drainage of the field. The base materials should contain the necessary components and characteristics to satisfy local conditions. A good geotechnical report will provide essential information for a firm and stable base for the synthetic turf. 2. Soil Separator: Depending on the local site conditions, a geo-textile fabric may be placed over the entire sub-grade and within the pipe trenches prior to the installation of the base materials to minimize contamination of the aggregate and possible clogging of the perforated drainage pipes. Where soil conditions warrant, a polyethylene, PVC, or other impermeable sheet liner may be used in lieu of the geo-textile to inhibit storm water infiltration into the subsoil. 3. Aggregate: The aggregate materials utilized to construct the field base must be a properly graded washed crushed stone to provide a balance between stability and permeability. A highly fractured material is desirable to provide the surface stability required for the synthetic turf surfacing, supplemental padding or porous paving as applicable. The graded aggregate particle sizes must be tightly controlled to fall within the bandwidth for all specified sieve sizes with just enough lines to provide stability while still allowing for sufficient drainage. Minimum stability and permeability requirements should be determined and confirmed by an independent certified laboratory prior to construction of the base course. 4. Compaction: The base materials should be thoroughly compacted to prevent differential settlement across the field area. Minimum compaction levels typically should not be less than 95% density as measured by a standard proctor test. Special attention should be given to backfill compaction of any utility trenches that cross the field area. Care should also be taken not to over compact, which could affect drainage. 5. Pavement: If pavement is required by design, the base materials may be porous or conventional asphalt. This material is installed over a permeable aggregate base and a subsurface drainage system. The porous pavement material must be manufactured with tight quality control on asphalt content, as well as the gradation of the aggregate used in the mix. This aggregate should have a limited amount of lines to allow for efficient water permeability. Use of conventional asphalt paving will require a sloped field with either a crown or a cross slope. Consideration should be given to the use of a drain- age mat or an elastic layer pad system between the turf backing and the surface of the pavement. This, along with the installation of periodic interceptor drains, should allow for horizontal water movement below the field's surface. Without the use of these materials, the infill layer will become saturated during periods of heavy rainfall and there may be migration of the infill materials with the surface water movement. 6. Water permeability rates for both the field's surfacing and the field base materials should be designed to accommodate the local weather patterns and storm water management regulations. The permeability of both the field surface and the base materials will typically decrease over the life of the field. An adequate factor of safety should be utilized to provide initial infiltration rates for the completed field above those required by the local weather conditions.
9.1.46.	Shock Absorbing Resilient Underlayment Systems 1. In situ Cushion Layer (elastic layer pad): If included in the design, these cushion systems should be installed in place with specialized paving equipment.

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	2. Physical Characteristics: These systems are typically comprised of SBR rubber granules bound with a single component polyurethane binder. Small rounded pea gravel aggregate or other suitable materials can also be incorporated with the rubber and urethane materials. The firmness of the system can be adjusted with the size and the pro- portions of the rubber granules and aggregate materials, as well as with the amount of polyurethane binder used and the thickness of the layer. 3. Performance Characteristics: The selection of the cushion layers should be closely coordinated with the performance characteristics of the synthetic turf utilized. The cushion layers should provide shock absorption without compromising footing and surface stability. 4. Prefabricated Cushion Layers (Pad): If included in the design, these cushion layers are rolls or tiles of resilient material installed under and occasionally adhered to the synthetic turf backing. a. Physical Characteristics: Prefabricated cushion layers are typically comprised of rubber, polyurethane foam, or other suitable materials. The rubber pads are SBR rubber fibers or granules bound together with a polyurethane binder and usually come as roll or piece goods and should be permeable. The foam cushion layers are typically polyurethane or polyvinyl chloride and should be water permeable for drainage. b. Performance Characteristics: The selection of the cushion layers should be closely coordinated with the performance characteristics and requirements of the synthetic turf system utilized. The cushion layers should provide shock absorption without compromising footing and/or surface stability. c. Water Permeability Rate: The system is to be permeable by design with adequate drainage, perforations through all of the cushioning layers to provide for adequate drainage through the system as specified.
9.1.47.	Irrigation System: 1. The installation of a manual or automatic irrigation system can be considered for synthetic turf installations. Guidelines on whether synthetic fields are watered are determined by factors such as region, climate, turf material, player traffic type, and level of games played. 2. It is recommended that the design be reviewed and approved by a recognized irrigation consultant or landscape designer.
9.1.48.	Seams: 1. Each panel or roll should be attached to the next with a seam to form the playing substrate of the field. Seams should be glued with a supplemental backing material or sewn with high strength sewing thread. The bonding or fastening of all system material components should provide a permanent, tight, secure, and hazard-free athletic playing surface. 2. Adhesive: Synthetic turf adhesives should be applied by experienced, professional installers. The adhesives should provide a strong, hazard-free, and durable bond between the adjacent turf panels or sections and to be usable for installation under variable weather conditions. The adhesive should also be resistant to water, fungus, and mildew. Synthetic turf adhesives include: one- part adhesives (urethanes), two-part (epoxy or urethane), hot melt, and water- based (latex). 3. Seaming Tape: The tape is comprised of a fabric that should be installed below the backing material on both sides of a seam or inlay. The fabric used for seaming tape should provide dimensional strength and enough surface texture and width to bond well with the adhesive and the turf backing material on each side of the seam.
9.1.49.	Field Lines and Markings: 1. Installation: Lines and markings should be installed on the synthetic turf surface in one of three methods: with paint, with colored fiber that is either tufted or knitted into

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	the synthetic turf panels, or installed as inlays. Tufted in or inlaid lines and markings are a permanent part of the surface. 2. Painted lines and markings installed with either permanent or temporary paint require maintenance. Even permanently painted lines require additional paint on a periodic basis. 3. Synthetic turf and fibers utilized for the tufted or inlaid lines and markings should be similar to that used in all other areas of the field and installed to the same tolerances. 4. A complete field "Lining, Marking, and Field Boundary" system will be provided with the installation of the surfacing system. 5. Field markings are to be installed in accordance with approved project shop drawings and marking plan. 6. Tufted lines, hash marks, ticks, and number markings, shall conform to the manufacturers' specifications and recommendations. 7. Striping layouts shall be accurately surveyed by the Contractor before installation of tufted field markings. 8. Install tufted lines and markings only when the surface is completely dry. 9. AEPA Member will provide logos as required in a format that the contractor requires. The Contractor shall submit shop drawing of logo to include colors, dimensions and locations for approval prior to ordering and installation.
9.1.50.	Inserts: 1. They can include covers for goal sleeves and anchors and conversion of baseball infield clay areas to synthetic turf. 2. The synthetic turf used for the inserts should be similar to that used in the area adjacent to the insert. 3. The inserts should be anchored securely to the surrounding areas so that they cannot be displaced by the activities occurring on the field and installed to the same tolerances. 4. Synthetic Turf Material Production Quality Assurance. 5. Testing of materials should be performed prior to shipment of product to the job site. 6. The synthetic turf rolls should be randomly sampled and tested by the manufacturer who will certify that they meet the specification. 7. Testing may include pile composition, pile weight, total weight, pile height, tuft bind (without infill), and grab/tear strength. 8. The manufacturer, to certify in writing at the owner request that the test results meet or exceed the synthetic turf specification.
9.1.51.	Construction and Installation 1. Inspection: Synthetic materials should be inspected prior to installation for: a. Damaged or defective goods b. Missing goods or quantities c. Correct fiber type d. Correct turf pile height and weight e. Proper tuft bind f. Correct backing perforation diameter and spacing, if applicable g. Materials out of tolerance with the specification h. Sub-Grade Preparation: The sub-grade should provide a stabilized foundation upon which base materials and subsequent components of playing field systems will be installed. i. Function: It should also provide the pitched surface on which storm water is directed toward the active drainage system for evacuation. j. Shape and Compaction: Prior to placement of base materials, the sub-grade should be shaped to an appropriate profile and compacted by proof rolling to obtain a firm even surface. Depressed areas should be filled, and unsuitable

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	materials removed and replaced with clean fill or aggregate. Compaction should be performed to achieve a minimum of 95% in accordance with ASTM D698 Standard Proctor Method. The appropriate moisture content must be maintained in the field sub-grade to allow for optimal levels of compaction. k. Sub-Grade (Rough) Planarity: The tolerances for the finished sub-grade should not exceed one-half (1/2") inch as measured by a 10-foot straight edge (13mm in 3m). Grading of the sub-grade shall minimize pending to the extent practical. The use of laser guided, and controlled equipment is highly recommended for sub-grade preparation.
9.1.52.	Sub-Grade Preparation 1. The sub-grade should provide a stabilized foundation upon which base materials and subsequent components of playing field systems will be installed. 2. It should also provide the pitched surface on which storm water is directed toward the active drainage system for evacuation. 3. Shape and Compaction: Prior to placement of base materials, the sub-grade should be shaped to an appropriate profile and compacted by proof rolling to obtain a firm even surface. Depressed areas should be filled and unsuitable materials removed and replaced with clean fill or aggregate. Compaction should be performed to achieve a minimum of 95% in accordance with ASTM D698 Standard Proctor Method. The appropriate moisture content must be maintained in the field sub-grade to allow for optimal levels of compaction. 4. Sub-Grade (Rough) Planarity: The tolerances for the finished sub-grade should not exceed one-half (1/2") inch as measured by a 10-foot straight edge. Grading of the sub-grade shall minimize pending to the extent practical. The use of laser guided and controlled equipment is highly recommended for sub-grade preparation.
9.1.53.	Aggregate: 1. Installation of the aggregate base should provide a close, evenly textured surface meeting the required tolerances. 2. Extreme care should be taken to ensure that there is no disturbance to the sub- grade and that there is no displacement of the soil separator. All disturbed, displaced, or damaged material is to be repaired or replaced. 3. The aggregate base should be placed in a manner that will produce a uniform and evenly graded mass to the specified depth. The material should be placed and spread by the appropriate equipment and methods in successive horizontal layers not exceeding the depth per synthetic turf manufacturer's specifications. Pockets that occur as a result of stone segregation during installation should be removed and replaced. After correct placement, each lift shall be uniformly compacted with a self-propelled roller to achieve the specified density. 4. The field base materials should be thoroughly compacted to prevent any significant differential settlement across the area of synthetic turf surfacing. The appropriate moisture content must be maintained in the base materials to allow for optimal levels of compaction. 5. Finish-Grade Planarity (surface tolerances): Irregularities in the surface of the base materials are typically reflected in the finished field surface. To controlled tolerances the contractor is to use a laser guided and controlled equipment for subgrade preparation. The local deviation of the finished surface of the base stone should not exceed ¼ in. in any direction when measured beneath a 10-foot long straight edge. Hollows and depressions, which may have developed during the process of compacting the base, should be filled with acceptable material and re-compacted.
9.1.54.	Shock Absorbing Resilient Underlayment System: 1. Cushion-Layer (Elastic Layer Pad) Installation: If required by design, the in situ cushion layers should be installed with specialized paving equipment used only for in

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	situ pad. All paving seams should be hand rolled and troweled. All cold joints in the pad should be pretreated with a polyurethane primer. The specified thickness of the in situ pad should be continuously monitored for consistency. The components of the in situ cushion layers should be thoroughly mixed. The mixing ratios should also be monitored for consistency. The cushion-layer system should be securely placed on the field base materials. The in situ cushion surface should not vary more than ¼ in. in 10 ft. as measured in any direction with a string line or straight edge. 2. Seam Installation: If required by design, prefabricated cushion-layer systems are typically installed as roll or piece goods. The head seams at the end of each roll should be staggered across the field. When required by the padding manufacturer, all glued cushion-layer seams should be butted together and a permeable or mesh type fabric should be adhered to the surface of the cushion layer at all seam locations to bridge the cushion-layer joints. (This does not apply to sewn seams). 3. Resilient Infill: If required by design, the infill material should be applied when in a dry condition and should not be applied unless the synthetic turf is also dry. The infill material should be applied in consistent layers with multiple applications. It is critical to insure that synthetic fibers are not trapped underneath the infill. After application of each layer, the synthetic turf should be dragged and/or brushed according to the manufacturer's recommendations in order to lift the fibers and distribute the infill material into the turf system in a consistent manner.
9.1.55.	Synthetic Turf Material Production Quality Assurance/Quality Control: Testing of materials should be performed prior to shipment of product to the job site to avoid additional costs or delay. 1. Quality Assurance Testing: Prior to shipment of the synthetic turf and components to the job site, the synthetic turf rolls should be randomly sampled and tested by the manufacturer who will certify that they meet the specification. 2. Relevant Characteristics: Testing to be conducted should be a provision in the agreement between the parties and may include pile composition, pile weight, total weight, pile height, tuft bind (without infill), and grab/tear strength. 3. Labeling: The manufacturer, at his option, should convey in writing the test results of the relevant characteristics and certify that they meet or exceed the specification requirements.
9.1.56.	Synthetic Turf Installation: 1. All synthetic turf systems should be installed to provide stability that will prevent panels from shifting or bunching. 2. The synthetic turf panels should be securely fastened together for the warranted life of the system. These seams can be glued or sewn depending upon the synthetic turf system. Seam gaps should be minimal and uniform. For tufted infill systems the gap between the fibers should not exceed the gauge of the tufting. For other synthetic turf systems, the seam gaps should not exceed 1/16 in. 3. Edge anchoring may consist of a concrete curb, a treated wood header, a composite material, or a trench drain. These may vary by design and region, but should always provide a secure anchor. 4. Inlaid lines and markings should consist of synthetic turf with contrasting colored fiber installed in lieu of painted fiber. Inlay gaps should be uniform. For tufted systems, the gap between the fibers should not exceed the gauge of the tufting. Lines and markings must conform to the appropriate association or organization suggested guidelines for the intended level of use. 5. Care should be taken during installation to account for rapid fluctuations in temperature to avoid expansion and/or contraction which can affect the final installation. Temperature extremes should also be carefully monitored. The carpet should never be rolled or unrolled when frozen, which can cause cracking and

Item	Description
	irreparable damage to the secondary backing. 6. Infill material installation to follow the manufacturer's installation recommendations. 7. G-Max testing to be performed by an independent testing company or lab.
9.1.57.	Infill Material Installation: Correct installation is critical to performance of these systems and should follow the manufacturer's recommendations. 1. Environmental Conditions: It is recommended infill materials should be in- stalled under dry field conditions. 2. Method of Application: The infill material should be installed uniformly. The equipment used for the application of the infill materials should erect the fiber, place the infill materials, and should incorporate a metering method to provide consistent distribution. The equipment utilized should not distort or displace any base materials or damage the system in any way. 3. Infill Depth: The depth of infill can be measured by taking the depth from the top of the primary backing to the top of the infill or subtracting the length of exposed fiber from the known pile height. 4. G-Max Testing: G-Max testing should always be performed by an independent testing company or lab.
9.1.58.	Fiber Conditioning: It is essential to maintain the integrity and uniformity of the fiber throughout the manufacturing, shipping and handling, installation and maintenance processes in order to prevent damage, which could alter the specified performance and void the warranty.
9.1.59.	Clean-Up 1. Turf contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surfaces and installed items. 2. All usable remnants of new material shall become the property of the AEPA Member . 3. The turf contractor shall keep the area clean throughout the project and clear of debris. 4. 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 AEPA Member .
9.1.60.	Field Quality Control 1. At the time of substantial completion and bi-annually during the life of the warranty, the Contractor shall perform a series of tests using an independent testing agency to evaluate the shock absorption characteristics of the field. The tests shall be performed on a 50-foot grid in both directions using an accelerometer in accordance with ASTM F1936 and ASTM F355. Test the field at a minimum of 12 points and submit the results to the Owner within 30 days of testing. At no point shall any reading exceed 160 Gmax during the life of the warranty. If any point exceeds the maximum deceleration, the Contractor shall make corrections to provide the allowable Gmax deceleration at the Contractor's expense. Owner has the option to engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports. 2. Testing and inspecting of completed applications of synthetic turf system shall take place in suggestive states, in areas of extent and using methods that are industry standard. 3. The Contractor is to remove and replace items where test results indicate that it does not comply with specified Gmax requirements.
9.1.61.	Synthetic Turf Maintenance 1. The turf manufacturer to provide detailed written maintenance instructions and training of maintenance personnel. Maintenance to include but not limited to cleaning, stain removal, minor seam repair, dragging, or redistribution of any infill material, and management of infill compaction. The Vendor Partner can offer equipment and supplies that are required for the maintenance of the synthetic turf surface. Utilizing

Item	Description
	this equipment as recommended by the turf manufacturer will generate the proper maintenance in relation to any future warranty claims. 2. Seam Repair: Seams that open or become loose may require some immediate and temporary gluing until they can be inspected and corrected by the installation builder. The gluing should conform to the written maintenance suggested guide- lines provided by the synthetic turf vendor.
9.1.62.	Quality Assurance 1. Manufacturer - Proposed solutions must be equal to or better than those available from nationally-recognized manufacturers specializing in outdoor synthetic turf products for athletic and recreational facilities. 2. Manufacturer Qualifications - Manufacturer must have ten (10) years of experience in the manufacture of synthetic turf systems which meet and/or exceed the standards and guidelines presented herein. 3. Engineering Qualifications - The Vendor Partner must have a professional engineer, licensed in the state where the field is to be installed to review and certify that the proposed site, site conditions and synthetic turf system being supplied and installed meets or exceeds the design criteria of the specifications, and the site conditions exceed the minimum requirements of the system's design performance standards set by the manufacturer. 4. Installer Qualifications - Factory-trained and certified with a minimum of three (3) years' experience of successfully installing synthetic turf systems. Must have the appropriate contractor's license as required by the state or local jurisdiction where the field will be installed and be a certified synthetic turf installer.
9.1.63.	Project Documents and Submittals 1. Design Documents a. Planning b. Grading Plan c. Drainage Plan d. Edge Details e. Installation Instructions and standards 2. Project Schedule a. Shop Drawings - Show all site preparation, materials, supplies and fixtures to be furnished even if provided by others. b. Synthetic Turf Product Data Sheet and Specifications. c. Material Safety Data Sheets (MSDS) d. Testing Requirements i. G-Max Testing ii. Lead and Heavy Metal Testing iii. All turf fiber, infill, base and subbase, etc 3. Maintenance Manual and Instructions 4. Samples - Samples of materials and colors as requested by the owner or owner's representative. 5. Detail information on all items and work to be provided and/or performed by the AEPA Member and stipulate minimum requirements. 6. Warranty a. Written warranty documents b. Warranty insurance policy. 7. Cost Proposal - Detail breakdown of all costs associated with the design, manufacture, delivery, installation, and warranty of the proposed solution per contract documents.
9.1.64.	Project Close-out 1. The Contractor and the AEPA Member's representative shall conduct a complete and extensive site inspection of all work performed and products provided and installed.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>2. The Contractor shall provide the necessary testing data to the owner that the finished field installed meets the required shock attenuation, as per ASTM F1936.
3. The turf material shall be non-combustible and pass the DIN standard Pill Burn test or ASTM D 2859.
4. The Contractor to provide a written acceptance by the turf manufacturer that the turf and base system is installed in accordance with their recommendations prior to final completion.
5. Upon completion of the work, the Vendor Partner will present the AEPA Member with all documents necessary. to close out the project. Including, but not limited to:
6. Certificate of occupancy.
7. Maintenance manuals.
8. Up to four (4) complete sets of "as built" project drawings, showing the actual locations of seams, drains, in-ground equipment and other accessories installed/provided as required by AEPA Member.
9. Minimum of two (2) copies each of any installed equipment as required by AEPA Member.
10. Manufacturer's Instructions and Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and markings, procedures of use and executed warranties on installed products and equipment.
11. Any state, local and/or manufacturer's inspection report or certificate certifying that all state, local and manufacturer's standards, codes and requirements have been met.
12. All warranty information.</td></tr>
<tr><td>9.1.65.</td><td>Material Specification, Performance Guidelines, Properties and Lab and Field Tests Requirements
1. All minimum and maximum values take into account acceptable industry manufacturing tolerances plus or minus 2% of the variance.
2. Testing to meet the minimum standards of the Synthetic Turf Council recommendations are for specific purposes such as the following.
3. All minimum values should be evaluated as they relate to the system performance.
4. Site testing shall be at ambient shaded air temperature of 40 - 100°F. Laboratory testing shall be at ambient indoor temperature unless otherwise specified by the test method.</td></tr>
<tr><td>9.1.66.</td><td>Base Materials Test Requirements
<table>
<tr><th>Test Property</th><th>Method of Determination</th><th>STC Guidelines</th><th>Lab/Field Test</th></tr>
<tr><td>Size of particle mix</td><td>ASTM D422 Particle size analysis</td><td>As per specification</td><td>Lab (on site material)</td></tr>
<tr><td>Drainage</td><td>ASTM F1551/DIN 18035:6 Permeability to water*

ASTM D2434 Permeability of Granular Soils (Constant Head)</td><td>Min. of 0.01 cm/s (14 in. per hour)</td><td>Lab or Field **</td></tr>
</table></td></tr>
</table>

Item	Description			
	Compaction (Density)	ASTM D698 Compaction Using Standard Effort ASTM D2922 Compaction of Soil In Place by Nuclear Methods	To set criteria for ASTM D2922 Min. 90% Standard Proctor	Lab/Field
	Final Grade	ASTM F2157 Test method for Base Material Evenness	Less than 1/4 in. over 10 ft 6mm over 1m	Field

1. Determination in the lab: It is necessary to seal the test ring to the base of the sample. The edges of the sample must also be sealed to prevent any water from flowing around rather than through the sample.
2. ** Determination in the field: An exact seal is typically not attainable and the test is not as accurate/reproducible due to the lateral flow of water and the problems of determining the areas through which the water is flowing.

Item	Description
9.1.67.	Turf Characteristics For Tufted Infill Systems (Typical for High School, Collegiate, and Professional Playing Fields).

Test Property	Method of Determination	STC Guidelines	Lab/Field Test
Manufacturer of System (name)	Manufacturer Declaration	Not Specified	N/A
Pile Fiber ID	Manufacturer Declaration	Not Specified	N/A
Primary Backing System ID	Manufacturer Declaration	Not Specified	N/A
Secondary Backing System ID	Manufacturer Declaration	Polyurethane/Latex/Fabrics	N/A
Pile (face weight)	ASTM D5848	Min. 30 oz./sq. yd.	Lab
Primary Backing System Weight	ASTM D5848	Min. 5.5 oz./sq. yd.	Lab
Secondary Backing System Weight	ASTM D5848	Min. 16 oz./sq. yd.	Lab
Pile Height	ASTM D5823	Sport specific or as specified	Lab/Field
Pile Height above infill	Measurement	Must meet system specs	Lab/Field
Yarn Thickness	ASTM D3218	Min. 75 microns	Lab tested
Yarn Denier	ASTM D1577	Min. 500 (nylon)	Lab tested
Grab Tear Strength	ASTM D5034	Min. 150 lbs.	Lab
Tuft Bind	ASTM D1335	Min. Avg. 6 pounds	Lab only
Flammability	ASTM D2859 "Burning Pill"	Passing result tested as installed	Lab
Color Uniformity	Visual	No significant change	Lab & Field

Item	Description
9.1.68.	Turf Characteristics for Knitted Turf Systems

Test Property	Method of Determination	STC Guidelines	Lab/Field Test
Manufacturer of System (name)	Manufacturer Declaration	Not Specified	N/A
Pile Fiber ID	Manufacturer Declaration	Not Specified	N/A
Primary Backing System ID	Manufacturer Declaration	Not Specified	N/A
Secondary Backing System ID	Manufacturer Declaration	Glued: Acrylic Loose laid: Polyurethane, or Acrylic	N/A
Pile (face weight)	ASTM D5848	Min. 55 oz./sq. yd.	Lab
Primary Backing System Weight	ASTM D5848	Min. 8 oz./sq. yd.	Lab
Secondary Backing System Weight	ASTM D5848	Glued: Min. 3 oz./sq. yd. Loose laid: 1/4 in. (6 mm) pre- coat & attached cushion weight combined is min. 50 oz./sq. yd.	Lab
Pile Height	ASTM D5823	Min. 0.5 in.	Lab/Field
Pile Height above infill	Measurement	N/A	Lab/Field
Yarn Denier	ASTM D1907	Min. 500 (nylon)	Lab
Yarn Thickness	ASTM D3218	Min. 75 microns PE Min. 50 microns PP	Lab
Grab Tear Strength	ASTM D5034	Min. 350 pounds	Lab
Tuft Bind	ASTM D1335	Min. Avg. 6 lbs.	Lab
Flammability	ASTM D2859 "Burning Pill"	Passing result tested as installed	Lab
Relative Abrasiveness	ASTM F1015	Measurement	Lab
Color Uniformity	Visual	No significant changes	Lab & Field

9.1.69. Turf Characteristics for Tufted Polypropylene (Pp), Polyethylene (Pe), Or Nylon Systems (Non-Infill Systems).

Test Property	Method of Determination	STC Guidelines	Lab/Field Test
Manufacturer of System (name)	Manufacturer Declaration	Not Specified	N/A
Pile Fiber ID	Manufacturer Declaration	Nylon 6 or 6,6; PP, PE	N/A
Primary Backing System ID	Manufacturer Declaration	Not Specified	N/A
Secondary Backing: System ID	Manufacturer Declaration	Polyurethane	N/A
Pile (face weight)	ASTM D5848	Min. 48 oz./sq. yd.	Lab
Primary Backing Weight	ASTM D5848	Min. 6 oz./sq. yd.	Lab
Secondary Backing System Weight	ASTM D5848	Min. 16 oz./sq. yd.	Lab
Pile Height	ASTM D5823 or D6859	Min. 0.45 in.	Lab/Field
Pile Height above infill	Measurement	N/A	Lab/Field

Item	Description

Fiber Conditioning	Manufacturer Declaration Texturized	Texturized	N/A
Yarn Denier	ASTM D1907	Min. 500 Nylon	Lab
Yarn Thickness	ASTM D3218	Min. 75 microns PE Min. 50 microns PP	Lab
Yarn Elongation	ASTM D2256	N/A	Lab
Grab Tear Strength	ASTM D5034	Min. 150 pounds	Lab
Yarn Breaking Load (Tensile strength)	ASTM D2256	Mfr. recommended spec	Lab
Tuft Bind	ASTM D1335	Min. Avg. 6 lbs.	Lab
Flammability	ASTM D2859 "Burning Pill"	Passing result tested as installed	Lab
Color Uniformity	Visual	No significant changes	Lab & Field

9.1.70. INFILL Materials

1. Infill Materials: The most recent generation of synthetic turf systems utilizes a long pile height and needs to be supported with infill materials for directional stability and structural integrity, as well as resiliency. The infill materials commonly used are sand, rubber, other suitable materials, or combinations of the following:
2. EPDM (Ethylene Propylene Diene Monomer) is a polymer elastomer with high resistance to abrasion and wear and will not change its solid form under high temperatures. Typical EPDM colors are green and tan. EPDM has proven its durability as an infill product in all types of climates. Its excellent elasticity properties and resistance to atmospheric and chemical agents provide a stable, high performance infill product.
3. TPE (Thermo plastic elastomer) infill is non-toxic, heavy metal free, available in a variety of colors that resist fading, very long lasting, and 100% recyclable and reusable as infill when the field is replaced. TPE infill, when utilizing virgin--- based resins, will offer consistent performance and excellent g-max over a wide temperature range.
4. Organics: There are several organic infill utilizing different organic components, such as natural cork and or ground fibers from the outside shell of the coconut. These products can be utilized in sports applications as well as for landscaping.
5. Silica Sand: This product is a natural infill that is non-toxic, chemically stable, and fracture resistant. Silica sand infills are typically tan, off-tan or white in color and depending upon plant location, may be round or sub-round in particle shape. As a natural product there is no possibility of heavy metals, and the dust/turbidity rating is less than 100. It can be used in conjunction with many other to provide a safe and more realistic playing surface. The round shape plays an integral part in the synthetic turf system. Silica sand have a high purity (greater than 90%) to resist crushing and absorption of bacteria and other field contaminants. Silica sand can either be coated with different materials as a standalone product or can be used to firm up in combination with traditional crumb rubber infill systems.
6. Coated Silica Sand: This class of infill consists of coated, high purity silica sand with either a soft or rigid coating specifically engineered for synthetic turf.
7. These coatings are either elastomeric or acrylic in nature (non---toxic) and form a bond with the sand grain sealing it from bacteria to provide superior performance and durability over the life of a field. Coated sand is available in various sizes to meet the application's needs.
8. Crumb Rubber: Two types of crumb rubber infill exist: Ambient and Cryogenic. Crumb rubber infill is substantially metal free, and, according to the STC's Guidelines for Crumb Rubber Infill Used in Synthetic Turf Fields, should not contain liberated fiber

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>in an amount that exceeds .01% of the total weight of crumb rubber, or .6 lbs. per ton.
9. Coated Rubber: Both ambient and cryogenic rubber can be coated with colorants, sealers, or anti---microbial substances if desired. Coated rubber provides additional aesthetic appeal, reduction of dust by products during the manufacturing process and complete encapsulation of the rubber particle.
10. Hybrid: Constitutes the use of sand, rubber, or other suitable materials in various combinations. (This should not be confused with hybrid carpet systems that consist of a combination of fiber types.)
<table>
<tr><th>Test Property</th><th>Method of Determination</th><th>STC Guidelines</th><th>Lab/Field Test</th></tr>
<tr><td>Material Identification</td><td>Manufacturer Declaration</td><td>Must meet system specifications</td><td>N/A</td></tr>
<tr><td>Grain Size (Particle Size)</td><td>ASTM D442 (soil)
ASTM D5644 (rubber)</td><td>Must meet system specifications</td><td>Lab</td></tr>
<tr><td>Depth</td><td>Measurement from top of infill to surface of fabric</td><td>Must meet system specification at all locations 3/8 in. (±9 mm)</td><td>Lab/Field</td></tr>
<tr><td>Flammability</td><td>ASTM D2859 "Burning Pill"</td><td>Passing result tested as installed</td><td>Lab</td></tr>
<tr><td>Color Uniformity</td><td>Visual</td><td>No significant changes</td><td>Lab/Field</td></tr>
</table></td></tr>
<tr><td>9.1.71.</td><td>Shock Pad Layer Properties
<table>
<tr><th>Test Property</th><th>Method of Determination</th><th>STC Guidelines</th><th>Lab/Field Test</th></tr>
<tr><td>Material Identification</td><td>Manufacturer Declaration</td><td>Must meet system specifications</td><td>N/A</td></tr>
<tr><td>Mix Design</td><td>Manufacturer Declaration</td><td>Must meet system specifications</td><td>N/A</td></tr>
<tr><td>Drainage</td><td>ASTM F1551/DIN 18035-6 Water Permeability</td><td>Min. of 14 in. per hour</td><td>Lab/Field</td></tr>
<tr><td>Components Size Rubber / Stone (gravel)</td><td>ASTM F1508 Sieve Analysis</td><td>Must meet system specifications</td><td>Lab</td></tr>
<tr><td>Evenness</td><td>ASTM 2157: Test method for Base Material Evenness</td><td>Less than 1/4 in. over 10 ft. (6 mm over 3 m)</td><td>Field</td></tr>
<tr><td>Thickness</td><td>Measurement</td><td>Meet system spec at every point measured (+1/4 in./-0) (+6 mm/-0 mm) cushion layer</td><td>Lab/Field</td></tr>
</table></td></tr>
<tr><td>9.1.72.</td><td>Performance Guidelines for (North American) Football Fields
<table>
<tr><th>Property</th><th>Description</th><th>Test Method</th><th>STC Guidelines</th></tr>
<tr><td>Shock Absorption</td><td>A measure of the surface’s ability to absorb impact energy</td><td>ASTM F1936 (g-max)</td><td>Shall not exceed 200 at each test point*</td></tr>
<tr><td>Deformation</td><td>A measure of the degree a surface deforms when a player runs across it</td><td>ASTM F2157-02**</td><td>≤ 10 mm</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>Drainage</td><td>Measure of water passage</td><td>ASTM F1551</td><td>14 in./hr. Base
10 in./hr. Turf</td></tr>
</table>
</td></tr>
<tr><td>9.1.73.</td><td>Performance Guidelines for Soccer Fields
<table>
<tr><th>Property</th><th>Description</th><th>Test Method</th><th>STC Guidelines</th></tr>
<tr><td>Ball Rebound</td><td>A measure of how high a ball bounces vertically</td><td>ASTM F2117</td><td>30% - ≤ 50%</td></tr>
<tr><td>Ball Roll</td><td>A measure of how far a ball rolls</td><td>EN 12234</td><td>4m - 10m</td></tr>
<tr><td>Force Reduction</td><td>A measure of the impact energy absorption of a surface when a player runs across it</td><td>ASTM F2157-02</td><td>55% - 70%</td></tr>
<tr><td>Deformation</td><td>A measure of the degree a surface deforms when a player runs across it</td><td>ASTM F2157-02*</td><td>≤ 10mm</td></tr>
<tr><td>Rotational Resistance</td><td>A measure of the foot grip provided by the surface</td><td>EN 15301 Method 1</td><td>25Nm - 50Nm</td></tr>
<tr><td>Drainage</td><td>Measure of water passage</td><td>ASTM F1551</td><td>14 in./hr. Base
10 in/hr. Turf System</td></tr>
</table>
1. *To prevent compaction the mass must be caught after each impact
2. Legend
   a. ASTM - Test method published by the American Society for Testing and Materials
   b. EN -Test method published by the European Standards Organization
   c. FIFA -Test method described in FIFA Handbook of Test Methods and Requirements for Artificial Turf Football Surfaces</td></tr>
<tr><td>9.1.74.</td><td>Materials Specifications
1. The reference specifications, as established by the Synthetic Turf Council, are "typical" examples of minimums that are most commonly encountered and have fulfilled reasonable expectations for successful performance. Deviations from these minimums can be expected due to product innovations or quality upgrades and can be considered when properly justified in terms of their expected performance.
2. All tests prior to, during, or after installation are to be specifically listed and understood by all parties as to their execution and financial responsibility.
3. Environmental Conditions: Suitable weather conditions are important for the successful installation of the systems.
4. In the event of questionable conditions, the manufacturer's recommendation should be obtained to prevent the possible voiding of any warranties (particularly as it applies to adhesives).</td></tr>
<tr><td>9.1.75.</td><td>Synthetic Turf Specification
<table>
<tr><td>FIBER:</td><td></td></tr>
<tr><td>Material</td><td>PE, PP, Nylon 6, or Nylon 6.6</td></tr>
<tr><td>Denier</td><td>Must meet system specs</td></tr>
<tr><td>BACKING (primary/secondary):</td><td></td></tr>
<tr><td>Weight primary</td><td>Not less than 5.5 oz. Per sq. Yd.</td></tr>
<tr><td>Weight secondary</td><td>Not less than 16 oz. Per sq. Yd.</td></tr>
<tr><td>Additional backings</td><td>Optional</td></tr>
</table>
</td></tr>
</table>

Item	Description	
	FABRIC:	
	Width	12 ft. to 15 ft.
	Tuft bind	> 6.8 lbs. or 30 N
	Pile height	Sport specific or as specified
	Pile weight	Not less than 30 oz./per sq. yd. Must meet system specifications.
	Grab tear strength	Not less than 150 lbs.
	Pill burn test	Passing results tested as installed.
	INFILL SYSTEM:	Depending on Manufacturer's recommendation.
	Depth of infill	Nominal, per Manufacturer's recommendation.
	Impact attenuation	The standard for G-max is a maximum value of 165 at each test point. G-max values may vary from location to location on a playing surface. Such variances should be taken into account when
	Water Permeability	Turf cushion layer - min. 10 in./hour
	7.45.6.	Knitted Synthetic Turf Specification - Short pile
	FIBER:	
	Material	PE, PP, Nylon 6, or Nylon 6.6
	Denier	Min. 500 Nylon
	Thickness	Min. 75 microns PE or PP
	BACKING (primary/secondary):	
	Ground Yarn	Polyester multi-filaments
	Weight primary	Min. 8 oz./sq. yd.
	Acrylic	Min. 3 oz./sq. yd.
	Polyurethane attached cushion	optional
	FABRIC:	
	Width	Typically 15 ft.
	Tuft bind	N/A
	Pile height	Sport specific or as specified
	Pile weight	Min. 55 oz./sq. yd.
	Grab tear strength	Min. 350 lbs.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>9.1.76.</td><td>Tufted Synthetic Turf Specification - Short pile
<table>
<tr><td>FIBER:</td><td></td></tr>
<tr><td>Material</td><td>Nylon 6, Nylon 6.6, PE or PP</td></tr>
<tr><td>Denier</td><td>Min. 500 nylon</td></tr>
<tr><td>Thickness</td><td>Min. 75
microns</td></tr>
<tr><td>BACKING (primary/secondary):</td><td></td></tr>
<tr><td>Woven PP/non- woven</td><td>Single or multiple</td></tr>
<tr><td>Weight</td><td>Min. 6 oz./sq. yd.</td></tr>
<tr><td>Scrap Coat</td><td>Min. 16 oz./sq. yd.</td></tr>
<tr><td>Attached cushion Secondary and/or cushion</td><td>Min. 32 oz./sq. yd. (as required)</td></tr>
<tr><td>FABRIC:</td><td></td></tr>
<tr><td>Width</td><td>12-15 ft.</td></tr>
<tr><td>Tuft Bind</td><td>>6.8 lbs. or 30 N</td></tr>
<tr><td>Pile Height</td><td>Sport specific or as specified</td></tr>
<tr><td>Pile Weight</td><td>Min. 48 oz./sq. yd.</td></tr>
<tr><td>Grab Tear Strength</td><td>Min. 150 lbs.</td></tr>
<tr><td>Pill Burn Test</td><td>Passing results tested as installed</td></tr>
<tr><td>Total Weight</td><td>Depending on individual construction</td></tr>
<tr><td>SYSTEM:</td><td></td></tr>
<tr><td>Impact attenuation</td><td>The standard for G-max is a maximum value of 165 at each test point. G-max values may vary from location to location on a playing surface. Such variances should be taken into account when setting maximum values.</td></tr>
<tr><td>Water Permeability</td><td>Turf/cushion layer: min.
10 in./hour Base</td></tr>
</table></td></tr>
<tr><td>9.1.77.</td><td>Shock Pad-Pre-Fabricated Pad Systems Specification
<table>
<tr><td>Typical Requirement</td><td></td></tr>
<tr><td>Thickness</td><td>0.375 in. ± 10%</td></tr>
<tr><td>Density</td><td>4.0 lbs./cu. ft. ±10%</td></tr>
<tr><td>Weight</td><td>38 oz./sq. yd.</td></tr>
<tr><td>Width</td><td>4 ft.</td></tr>
<tr><td>25% Compression Resistance (ASTM D1667)</td><td>10-12 psi</td></tr>
<tr><td>Tensile Strength (ASTM D412)</td><td>Typically 75 psi</td></tr>
</table></td></tr>
<tr><td>9.1.78.</td><td>Shock Pad-In Situ Systems Specification (typical ranges)
<table>
<tr><td>Thickness:</td><td>35 mm</td><td>25 mm</td><td>20 mm</td></tr>
<tr><td>Density:</td><td>2 lbs./cu. ft.</td><td>1.5 lbs./cu. ft.</td><td>1.2 lbs./cu. ft.</td></tr>
<tr><td>Weight:</td><td>56 lbs./sq. yd.</td><td>40 lbs./sq. yd.</td><td>32 lbs./sq. yd.</td></tr>
<tr><td>Component:</td><td>SBR</td><td>Aggregate</td><td>PU Binder</td></tr>
<tr><td>Thickness</td><td>1-5 mm</td><td>1-3 mm</td><td></td></tr>
<tr><td>Percentages (by weight):</td><td>60-63%</td><td>30-32%</td><td>5-10%</td></tr>
</table></td></tr>
<tr><td>9.1.79.</td><td>Mix Design (all percentages by weight)
1. Note: Typically, the mix design is determined first, to satisfy the needs of the field in relation to its declared use. The mix design then will determine the weight, density, and thickness which should fall within the parameters indicated.
2. SBR granules to be dust free, no elongated particles are allowed.
3. Aggregate to be washed/clean, preferably round (pea gravel).</td></tr>
</table>

Item	Description
	4. Application to be performed by the use of continuous mixing device and suitable paving equipment.
9.1.80.	Warranty 1. The Prime Contractor shall provide a warranty to the owner that covers defects in the prep-work, installation and workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's onsite representative. 2. Manufacturer's warranty shall include for a period of eight (8) years: 3. General wear and damage caused from UV degradation. 4. The artificial grass field turf must maintain an ASTM 355 G-max in accordance with product specifications for the life of the warranty. 5. The warranty shall specifically exclude vandalism and acts of God beyond the control of the owner or the manufacturer. 6. Surface and the adhesives used in the installation are and will be free from defects in material and workmanship. 7. All defects for failures relating to field construction, drainage, synthetic grass seam rupture, and synthetic yarn UV stability, excessive wear and tensile strength. 8. The warranty must be supported by a paid-up insurance policy from an A.M. Best A-Rated insurance company to ensure that, if warranty work is required during the full eight (8) year required warranty period, the work can be obtained even if the manufacturer/Vendor Partner shall go out of business or no longer exist. 9. 100% of field is covered for the entire warranty period in case of catastrophic failure. 10. There are no periods of non-coverage during the warranty period. 11. No annual deductible per field for warranty repairs. 12. The Prime Contractor shall provide a warranty to the owner that covers defects in the prep-work, installation, and workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's on-site representative. 13. The Vendor Partner may offer extended warranties or maintenance agreements if available at an additional cost to AEPA Member s. The maintenance contract must be offered as a separate line item.
9.1.81.	The Contractor shall provide the necessary training for the proper care and maintenance for all material and equipment in order for them to develop a complete knowledge and understanding of the supplies, materials and equipment required to maintain and keep the synthetic turf system in good working condition through its product lifecycle.
9.1.82.	The Vendor Partner can offer and install in-ground equipment and accessories to include but is not limited to: 1. Pole Vault Pit -The Vendor Partner shall provide synthetic surfacing material plugs, which are to be installed level to the surfacing of the respective runway and be of similar texture as the surrounding synthetic surfacing. 2. Take-Off Boards 3. Shot Put Toe Boards 4. Shot Put Rings 5. Discus Rings 6. Combination Hammer/Discus Cage and cage must meet IAAF rules 7. Hammer/Discus Conversion Ring 8. Water Jump Hurdle with sleeves 9. Water Jump Cover - The Vendor Partner is to install track surfacing onto the cover. The cover, when installed with synthetic surfacing on it, shall be flush with the surrounding area. 10. Removable Track Curbing. The curb shall meet the requirements of the IAAF. 11. Long Jump Sandpits and Traps.

Item	Description
	12. Sand - All sand for the long/triple jump sand pits shall be clean, washed, white sand, containing not more than five percent (5%) clay and shall be free of trash, organic matter, and rock. Installed sand shall meet all specifications of the IAAF - washed river sand, 0 to 2mm graining, no organic components, max 5% of weight up to 0.2mm. Prior to installation, the Vendor Partner shall provide the AEPA Member with a one (1) gallon sample for approval. 13. Football goal posts and soccer goals 14. Batting Cages 15. Field groomer and sweeper 16. Replacement of grass or re-seeding of natural grass as part of the synthetic turf project.

Category 2 - Natural Turf for Sport Field

Item	Description
9.2.1.	General Requirements 1. Provide technical and consulting services to AEPA Members relating to athletic and recreational field surface design, characteristics, construction, and integration into the development of a new athletic or recreational facility. 2. Provide existing site inspection and investigation to identify soil conditions existing at the site in order to take into account the conditions found in the designing of athletic and recreational fields. The investigation shall include, but not be limited to: a. Stripping, placement of backfill and base construction in order to ensure the minimization of the risk of problems due to subsoil and subgrade conditions. b. Soil inspection for the existence of peat or other organic soils at the site. c. Inspection for uncontrolled fill materials or waste materials at the site. d. Inspection for expansive soils at the site. e. High ground water conditions or surface water retention areas (low area flooding). 3. Provide all labor, materials, equipment and drawings required to provide design services for a project cost proposal with a complete scope of work, including all products, services and athletic and recreational field specifications with their associated costs. A preliminary construction time schedule shall be a part of the project proposal. 4. Provide all labor, materials, equipment, project drawings and construction documents necessary to establish, construct, install lines and markings required to complete the athletic or recreational field as identified and specified within the project documents for the individual AEPA Member's project scope of work and documents. 5. Provide all labor, materials and equipment required to assess and evaluate existing facilities and develop and establish a plan of action for maintenance, repair and/or renovation of the existing athletic and recreational field to condition as required by the AEPA Member. 6. Provide ongoing technical support and training services for AEPA Members' staff relating to the maintenance of this type of athletic field. 7. Assisting AEPA Members in developing a short-term action plan to remediate, resolve and/or remove any unsafe conditions and establish a long-term maintenance program for maintaining AEPA Member's turf installation in good working conditions. 8. Upon request, assist the AEPA Member and its design professional in design of turf field or facilities for new schools and public facilities. 9. Provide AEPA Members with necessary construction services for demolition, site preparation and installation of turf and accessories. 10. Provide AEPA Members with the necessary training and support services to allow their staff to conduct safety inspections, to perform maintenance, install equipment, structures and fixtures according to manufactures specifications and instructions.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>11. Upon request, provide the labor, equipment, supplies and materials to inspect and take any maintenance actions to bring the turf field into good working order.
12. All material shall be guaranteed to the extent that:
a. Installed in accordance and the manufacturer's specifications.
b. Will perform as specified per the manufacturer’s specifications</td></tr>
<tr><td>9.2.2.</td><td>General Requirement for Seeded and Sodded Athletic Fields
1. Base Grading
a. Native soil fields high in silt and clay are not suitable for intensive use because they provide poor drainage and easily compact during use. Therefore, native soil will likely have to be excavated from the site.
b. If topography permits, sand can be placed directly on the surface without excavation after level grading at a considerably reduced cost.
c. If excavation is necessary, it should be performed so that the finished grade at time of planting conforms to the sidelines or track area.
d. Optimum grading depth for high-quality fields should be 16 inches. This depth will be replaced with 4 inches of base material (pit-run gravel) and then 12 inches of sand.
e. Drain tiles are typically trenched into the subsoil at the bottom of this grading depth. Bases should be graded flat or have a crown of 6 inches from the center to the sidelines.
f. The drain lines are trenched, and the drains should be covered with fine gravel or coarse sand material before the sand is installed.
2. Base Material
a. “Base material” is defined as sand or pit-run gravel (naturally occurring deposits of sand and gravel) placed over the drain lines and the graded sub-base.
b. Base materials can include pit-run gravel with a maximum of 2 to 3 percent total silt and clay. Typical specifications for pit-run gravel are listed in Table 1.
c. Other materials may include pea gravel or coarse sand, with particles ranging from No. 8 to No. 3/8 screen.
d. Try to maintain textural uniformity in the profile.
e. The depth of base material can vary from 4 to 12 inches.
f. Deposit base material over the field to avoid disruption of the base grades and to prevent damage to the drainage lines.
g. During installation, never run wheeled equipment across drainage lines.
h. The base material can be brought to grade with light, tack-type equipment or light grading equipment.
i. Normal grading operations can be used to bring the field to grade, but never heavily compact the base material.

Table 1. Particle-size Specifications for Base Material
<table>
<tr><th colspan="3">Pit-run sand/gravel – base specifications</th></tr>
<tr><th>Sieve Size</th><th>Tyler Standard Screen U.S. Series Equiv. No.</th><th>Particles Passing</th></tr>
<tr><td>Millimeters</td><td>Inches</td><td>Percentage</td></tr>
<tr><td>87</td><td>3½</td><td>100</td></tr>
<tr><td>40</td><td>1½</td><td>80–100</td></tr>
<tr><td>20</td><td>3/8</td><td>70–100</td></tr>
<tr><td colspan="3">Meshes/inch</td></tr>
<tr><td>1.0</td><td>16</td><td>0–100</td></tr>
<tr><td>0.25</td><td>60</td><td>0–30</td></tr>
<tr><td>0.15</td><td>100</td><td>0–15</td></tr>
<tr><td>0.10</td><td>140</td><td>0–10</td></tr>
<tr><td>0.07</td><td>200</td><td>0–5</td></tr>
</table>
</td></tr>
</table>

Item	Description
9.2.3.	Subsurface Drainage 1. Installation of drainage lines is necessary when water tables are too close to the surface and must be lowered. Drainage should also be installed when subsoils are impermeable or so slowly permeable that turfgrass root zones remain saturated for extended periods. Subsoils that are moderately permeable (1/2 inch per hour or greater) do not require extensive drainage installation. A standard percolation test conducted at about 30 inches deep will help determine the need for drainage lines. 2. When drainage is necessary, install drain lines on 15-foot centers arranged longitudinally on the football field. This spacing will allow free movement of vehicles during the construction process and will facilitate rapid water movement into the drain lines. 3. Install drain lines 16 to 24 inches below the grassed surface at a 1- to 2-percent minimum grade. 4. Drainage trenches should be 6 to 8 inches wide and should be dug with laser-controlled machines. This will ensure the proper grade and depth of drain lines. Drainage trenches should be dug with a wheel ditcher with a cleaning shoe, which leaves a V-shaped, clean, and graded trench bottom. If other types of trenchers are used, the contractor should cut a level (flat) bottom and excavate 2 inches deeper than the required invert elevations and place 1/8-inch minus to 5/16-inch minus pea gravel 2 inches deep, leveled to grade for placement of the drain lines. 5. Try to select trenchers that will place the base material into a truck or trailer, or as far away from the trench as possible for easier removal and to prevent it from falling back into the trenches. 6. Remove from the site all material dug from the base or uniformly spread it over the area if it does not interfere with the final base grades. 7. Drain lines can be placed longitudinally from end to end on naturally sloping terrain or crowned fields, but this is not practical on flat terrain. 8. The herringbone method is a typical alternative to longitudinally oriented drain lines. 9. Typically, the field should be divided from the center and trenched in each direction, reducing the length of run in half. Since a perimeter drain should be installed around the football field to facilitate drainage of both the field and the running track, these longitudinal drain lines can be coupled with the perimeter drain and discharged into storm sewers or other suitable sites 10. Drain Lines Types a. Drainage lines are manufactured with slits 360 degrees around the tubing. b. Drainage lines with holes only on one side at 45-degree angles. This type always places the holes downward. 11. During installation, attempt to keep soil off the drain lines and trenches. Carefully cap blind ends and properly connect and tape all joints to prevent entrance of soil material or animals. 12. Drainage lines spaced on 15-foot centers should be installed with 3- or 4-inch, semi-rigid drainage tubes with slits or drilled holes to facilitate inflow of water. 13. After the drain lines are in place, backfill trenches with pea gravel (1/8 to 5/16 inch) or coarse sand to a depth of 2 to 4 inches over the top of the drain tubing to avoid migration of fine sand particles into the drain line, causing clogging of the drains. 14. Attach filter devices and wrapped around the tile or placed over the tile to prevent migration of the fine particles since they can clog the filter with fine particles and seal the drain lines. 15. Extend drainage lines through the end ends of the field and tie in with the perimeter drains near the running track. The drainage line surrounding the running track will intercept all field drains and should be 6 inches in diameter. 16. Install catch basins around the perimeter of the field over the 6-inch drain at strategic locations for rapid evacuation of water from running tracks.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>9.2.4.</td><td>Irrigation Installation
1. Irrigation is essential on sand-based fields.
2. Irrigation systems should be designed and installed by competent irrigation specialists.
3. Automatic irrigation systems with safety pop-up heads are best for sand-based athletic fields. Irrigation water can be more carefully controlled from this type of system.
4. Install irrigation heads at a grade somewhat higher than the finished surface; after the soil has settled and the grass has become well established, these heads can be lowered to their proper final height.</td></tr>
<tr><td>9.2.5.</td><td>Sand Selection
1. The sand rooting medium specifications are listed in Table 2 below.
2. Sand particles should fall between the ranges of No. 16 and No. 60 screen; however, sands with most of the particles between a No. 60 and No. 140 screen may be used for the rooting medium. Always specify sand by sieve size.
3. Surface sand depth will vary from 4 to 12 inches depending upon the quality of the base material.
4. Pit-run materials with high proportions of properly sized sand will allow the use of perhaps as little as 4 inches of finest quality sand for the surface.
5. The addition of organic material, mixed off-site into the surface sand medium, is optimal. Materials such as well-composted organic matter or fibrous sphagnum peat moss are acceptable for the organic matter amendment. Organic matter particle sizes should range from 1/8 to 3/16 inch. Avoid all materials that are coarser or finer than those indicated. Under no circumstances should decomposed peat material be used as an organic amendment on high traffic sports fields.
6. If organic materials are included with the sand top mix, do the premixing off-site with bucket loaders or other mixing equipment to get a homogeneous mixture of sand and organic matter, then place the mix over the playing surface. Incorporate no more than 20 percent organic material by a loose volume with the surface mixture. It is best to have samples of both the sand and organic material sent to a qualified soil testing lab to ensure the best sand and organic material combination that will give the optimum water holding capacity and drainage for the field. Each batch of root-zone mix should be tested before it is placed on the athletic field.
7. Bring the surfacing or rooting medium to a flat grade over the playing surface and moisten to permit easier grading and movement without severe rutting. Fields built to these specifications do not need to be crowned because of the porous root-zone medium and installed drain lines. Practice care and caution to avoid damage to installed sprinklers and drains. Do not use compaction devices on the surface material except for normal grading and tillage equipment.

Table 2. Particle-size Specifications for Sand Rooting
<table><tr><th colspan="3">Rooting Medium Sand Specifications</th></tr><tr><th>Sieve Size</th><th>Tyler Standard Screen U.S. Series Equiv. No.</th><th>Particles Passing</th></tr><tr><td>Millimeters</td><td>Meshes/inch</td><td>Percentage</td></tr><tr><td>4.5</td><td>4</td><td>100</td></tr><tr><td>2.0</td><td>10</td><td>95–100</td></tr><tr><td>1.0</td><td>16</td><td>85–100</td></tr><tr><td>0.5</td><td>30</td><td>50–70</td></tr></table></td></tr>
</table>

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>0.25</td><td>60</td><td>0–30</td></tr>
<tr><td>0.10</td><td>140</td><td>0–10</td></tr>
<tr><td>0.07</td><td>200</td><td>0.5</td></tr>
<tr><td>0.01</td><td>270</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>9.2.6.</td><td>Turfgrass
1. Seeding the Field
a. Must be able to grow in the AEPA Member State.
b. If the site is not sodded, seeding rates for football and other sports fields should be 4 to 6 pounds per 1,000 square feet of certified seed.
c. Mixtures should for the type of athletic field and usage by the AEPA Member.
2. Turfgrass Establishment
a. Nutrient applications should be based on soil tests.
b. Do not apply fertilizer materials until the field is brought to its final grade.
c. Lightly rototill all fertilizing materials and soil amendments into the top 4 inches of the final mix.
d. After the fertilizer materials have been incorporated, no surface sand movement should be allowed.
e. Fertilizers the field and slightly moisten the field and roll with a light roller or with a Brillion drill or suitable lightweight packing device to slightly firm the surface prior to seeding.
3. Planting
a. Use a Brillion drill or comparable landscape seeder for to uniformly spreads the seed and presses it into close contact with the soil surface.
b. Divide the seed in half and sow in opposite directions. This will ensure fewer skips in the planting.
c. In areas of considerable wind movement, hydroseeding with grass seed and approximately 1,200 pounds of fiber mulch per acre has been most successful in preventing the blowout of seed and sand. Another advantage of hydroseeding is that additional starter fertilizer can be added to the hydroseeder’s tank mixture and applied at the time of seeding. Broadcast methods of planting are less desirable than the methods mentioned.
d. After planting with a Brillion drill, no subsequent rolling is necessary. The addition of organic mulches to the surface is not necessary if automatic irrigation is available. Planting can be done anytime during the normal growing season in the Pacific Northwest. The ideal time is late summer or mid-spring. After the seed has germinated, or immediately before, apply a quick-release nitrogen source, such as urea ammonium nitrate or ammonium sulfate, at the rate of 1 pound of product per 1,000 square feet to provide soluble nitrogen for the emerging seedlings.
e. After the seed has been planted, it is important that the surface be kept continuously moist. This is one of the most important steps in establishing an athletic field. Exercise extreme care not to overwater the field, since nutrient leaching will occur. Apply frequent, small amounts of water until germination and seedling emergence is complete; these applications must be made frequently (i.e., 6 to 8 times per 24 hours) to ensure surface dampness at all times. Uneven germination and possibly no germination will occur if the surface dries.</td></tr>
<tr><td>9.2.7.</td><td>Turf Sod (Sod)
1. Sod Types
a. Thin-cut sod, which usually has about ¼ - ½” of soil, is easier to handle and will root faster than thick cut sod.</td></tr>
</table>

Item	Description
	b. Thick-cut sod can have as much as 1-2" of soil which makes it much heavier to handle and once laid properly it is ready for play immediately. 2. Prepare soil and surface before sod arrives. 3. Sod should be protected during transportation. 4. Sod shall be delivered to the site specified By the AEPA Member and off-loaded using equipment furnished by the sod supply contactor. Palletized or large-roll sod shall be off-loaded at the location(s) designated for this purpose at the installation site. 5. Time Limitations: Sod shall be harvested, delivered and installed/transplanted within a period of 24 hours, unless a suitable preservation method is approved prior to delivery. Sod not transplanted within this period shall be inspected and approved by the inspecting officer or his representative prior to its installation. 6. Pad Size: Individual pieces of turfgrass sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be plus or minus 0.5 inch (15 mm) on width and plus or minus five percent on length. Broken pads and torn or uneven ends will not be acceptable. 7. Strength of Turf Sod Sections: Standard size sections of turfgrass sod shall be strong enough that it can be picked up and handled without damage. 8. Moisture Content: Sod shall not be harvested or transplanted when its moisture content (excessively dry or wet) may adversely affect its survival. 9. Mowing Height: Before harvesting, the sod shall be mowed uniformly at a height of 1 to 2.5 inches. 10. Sod shall be reasonably free of diseases, nematodes and soil-borne insects. Specific nursery and/or plant materials laws may require that all sod entering inter-state commerce be inspected and approved for sale. 11. Installing of Sod a. All areas to be sodded shall be free of construction debris, stones, living vegetation, etc. All grades shall be established and maintained in accordance with the drawings and/or applicable specifications prior to installation. b. Properly grade and level the area to maximize surface drainage. c. Immediately prior to sodding apply starter fertilizer. d. Install sod to conform with irrigation zones, lightly watering immediately after installation of each zone. e. Till compost into 4-6" of soil. f. In case of clay subsoil add a high-quality compost. g. Lightly moisten the soil if the soil is dry at the time of sodding. h. The sod should be placed in a brick-like pattern, staggered so the edges do not line up. i. Minimize the number of edges that are exposed that could lead to desiccation. j. A light rolling could be helpful at this time to eliminate any air pockets. k. Watering is key now and important in promote rooting. l. Check to make sure that the watering has gone deeper than just the surface and has thoroughly wetted the underlying soil. m. Keep the soil moist and periodically check on sod to see how it is rooting. n. Avoid traffic until the sod is rooted which could take 1 week or so. o. To avoid layering problems once the turf is rooted core cultivate and remove the cores. p. Mowing can begin once the area is firm enough to handle traffic. q. A light application of nitrogen (½ lb./1,000 sq. ft.) may be beneficial 3-4 weeks after the sod has been laid.
9.2.8.	Delivery, Storage and Handling 1. Turf (Sod)to be installed within 12 hrs. of delivery.

Item	Description
	2. Store and dispose of herbicides and fertilizer in accordance with requirements of the AEPA Member State. 3. Protect all products from weather as specified by manufacturer instructions.
9.2.9.	Clean-Up 1. Turf contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surfaces and installed items. 2. The turf contractor shall keep the area clean throughout the project and clear of debris. 3. 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 AEPA Member .
9.2.10.	Field Quality Control 1. At the time of substantial completion and biannually during the life of the warranty, the Contractor shall perform a series of tests using an independent testing agency to evaluate the shock absorption characteristics of the field. The tests shall be performed on a 50-foot grid in both directions using an accelerometer in accordance with ASTM F1936 and ASTM F355. Test the field at a minimum of 12 points and submit the results to the Owner within 30 days of testing. At no point shall any reading exceed 160 Gmax during the life of the warranty. If any point exceeds the maximum deceleration, the Contractor shall make corrections to provide the allowable Gmax deceleration at the Contractor's expense. Owner has the option to engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports. 2. Testing and inspecting of completed applications of synthetic turf system shall take place in suggestive states, in areas of extent and using methods that are industry standard. 3. The Contractor is to remove and replace items where test results indicate that it does not comply with specified G-Max requirements.
9.2.11.	Field Markings and Decorations 1. A complete field "Lining, Marking, and Field Boundary" system will be provided with the installation of the surfacing system. 2. Field markings are to be installed in accordance with approved project shop drawings and marking plan. 3. Lines, hash marks, ticks, and number markings, shall be per AEPA Member Specifications and the sport governing body. 4. Striping layouts shall be accurately surveyed by the Contractor before installation of tufted field markings.
9.2.12.	Equipment and Accessories 1. The Offeror can offer and install in-ground equipment and accessories to include but is not limited to: a. Pole Vault Pit –The Offeror shall provide synthetic surfacing material plugs, which are to be installed level to the surfacing of the respective runway and be of similar texture as the surrounding synthetic surfacing. b. Take-Off Boards c. Shot Put Toe Boards d. Shot Put Rings e. Discus Rings f. Combination Hammer/Discus Cage and cage must meet IAAF rules g. Hammer/Discus Conversion Ring h. Water Jump Hurdle with sleeves i. Water Jump Cover - The Offeror is to install track surfacing onto the cover. The cover, when installed with synthetic surfacing on it, shall be flush with the surrounding area. j. Removable Track Curbing. The curb shall meet the requirements of the IAAF.

Item	Description
	k. Long Jump Sandpits and Traps. l. Sand – All sand for the long/triple jump sand pits shall be clean, washed, white sand, containing not more than five percent (5%) clay and shall be free of trash, organic matter, and rock. Installed sand shall meet all specifications of the IAAF – washed river sand, 0 to 2mm graining, no organic components, max 5% of weight up to 0.2mm. Prior to installation, the Offeror shall provide the AEPA Member with a one (1) gallon sample for approval. m. Football goal posts and soccer goals n. Batting Cages o. Mowers and striping equipment
9.2.13.	Project Close-out 1. The Contractor and the AEPA Member's representative shall conduct a complete and extensive site inspection of all work performed and products provided and installed. 2. The Contractor shall provide the necessary testing data to the owner that the finished field installed meets the required shock attenuation, as per ASTM F1936. 3. Upon completion of the work, the Offeror will present the AEPA Member with all documents necessary to close out the project. Including, but not limited to: a. Maintenance manuals. b. Up to four (4) complete sets of "as built" project drawings, showing the actual locations of seams, drains, in-ground equipment and other accessories installed/provided. c. Minimum of two (2) copies each of any installed equipment. i. Manufacturer's Instructions and Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and markings, procedures of use and executed warranties on installed products and equipment. ii. Any state, local and/or manufacturer's inspection report or certificate certifying that all state, local and manufacturer's standards, codes and requirements have been met. d. All drawings, maintenance manuals, drawings and warranties for the installed equipment shall be provided electronic format on a flash drive or CD or DVD. 4. The Contractor shall provide AEPA Member's personnel with the necessary training for the proper care and maintenance for turf, material and equipment installed.
9.2.14.	Warranty 1. The Prime Contractor shall provide a warranty to the owner that covers defects in the prep-work, installation, and workmanship, and further warrant that the installation was done in accordance with both the AEPA Member project documents and all equipment manufacturer's recommendations. 2. The Offeror may offer extended warranties or maintenance agreements if available at an additional cost to AEPA Member.

Category 3 - Running Track, Tennis and Athletic Courts

Item	Description
9.3.1.	General Requirements
9.3.2.	The Offeror must have the ability and capacity to provide all labor, materials, and equipment required to provide, site inspection and preparation and construction services for track, basketball, and tennis court construction. These services may be provided by the Offeror's own crews and staff or by subcontractors contracted and supervised by the Offeror.
9.3.3.	The Offeror is responsible for ensuring that the design and construction drawings and manual clearly indicate, identify and communicate the products, services and testing that must be provided to deal with site preparation and public utilities; track/court/field sub-base-works,

Item	Description
	drainage systems, concrete and asphalt base-works; and track/court/field surfaces that are in accordance and comply with ASBA, AAU, NCAA, NFHSA and state requirements.
9.3.4.	Assisting AEPA Members in assessing, evaluating and determining the safety and operational status of the various types of equipment, structures and surfaces found within educational playgrounds and recreational facilities. Providing AEPA Member with a complete and comprehensive report identifying areas of concern and surfaces needing maintenance, repair and/or replacement.
9.3.5.	Assisting AEPA Members in developing a short-term action plan to remediate, resolve and/or remove any unsafe conditions and establish a long-term maintenance program for maintaining AEPA Member's facilities in good working conditions.
9.3.6.	Upon request, assist the AEPA Member and its design professional in design new track and recreational courts for new schools and public facilities.
9.3.7.	Provide AEPA Member s with necessary construction services for demolition, site preparation and installation of all products offered under this RFP.
9.3.8.	Documentation signed by an authorized representative of the manufacturer will be provided to the Member stating that the track, basketball, or tennis court has no measurable traces of heavy metals, leachable mercury, or any other hazardous materials identified by the EPA. For comparison testing prior to installation and randomly during installation, an 8" x 10" sample of the material to be furnished to the Member's independent laboratory prior to installation if required.
9.3.9.	An additional 8" x 10" product sample, the same color, texture, thickness, etc. as the type of surfacing to be installed for this project shall be provided to the Member. This must be a representative sample of the product for comparison of color and texture during installation. This sample must be submitted and approved by the Member prior to installation.
9.3.10.	Upon completion of any line markings, the Offeror shall obtain written acceptance and approval of the markings by the AEPA Member's designated representative as being complete and meeting their requirements. This document shall state that the track, basketball, or tennis court markings and layout meets and complies with the governing bodies' such as AAU, NCAA, NFHSA, State Activity Association, etc.
9.3.11.	Provide AEPA Members with the necessary training and support services to allow their staff to conduct safety inspections, to perform maintenance according to manufactures instructions.
9.3.12.	Upon request, provide the labor, equipment, supplies and materials to inspect existing facilities and make any maintenance and repairs required to bring the facility into good working order.
9.3.13.	All material shall be guaranteed to the extent that:
9.3.14.	Installed in accordance and the manufacturer's specifications.
9.3.15.	Will perform as specified per the manufacturer's specifications
9.3.16.	The Offeror must have the ability and capacity to provide all labor, materials, and equipment required to provide, site inspection and preparation and construction services for track, basketball, and tennis court construction. These services may be provided by the Offeror's own crews and staff or by subcontractors contracted and supervised by the Offeror.
9.3.17.	The Offeror is responsible for ensuring that the design and construction drawings and manual clearly indicate, identify and communicate the products, services and testing that must be provided to deal with site preparation and public utilities; track/court/field sub-base-works, drainage systems, concrete and asphalt base-works; and track/court/field surfaces that are in accordance and comply with ASBA, AAU, NCAA, NFHSA and state requirements.
9.3.18.	Assisting AEPA Member s in assessing, evaluating and determining the safety and operational status of the various types of equipment, structures and surfaces found within educational playgrounds and recreational facilities. Providing Member with a complete and comprehensive report identifying areas of concern and surfaces needing maintenance, repair and/or

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	replacement.
9.3.19.	Assisting AEPA Member s in developing a short-term action plan to remediate, resolve and/or remove any unsafe conditions and establish a long-term maintenance program for maintaining AEPA Member 's facilities in good working conditions.
9.3.20.	Upon request, assist the AEPA Member and its design professional in design new track and recreational courts for new schools and public facilities.
9.3.21.	Provide AEPA Member s with necessary construction services for demolition, site preparation and installation of all products offered under this RFP.
9.3.22.	Documentation signed by an authorized representative of the manufacturer will be provided to the Member stating that the track, basketball, or tennis court has no measurable traces of heavy metals, leachable mercury, or any other hazardous materials identified by the EPA. For comparison testing prior to installation and randomly during installation, an 8" x 10" sample of the material to be furnished to the Member's independent laboratory prior to installation if required.
9.3.23.	An additional 8" x 10" product sample, the same color, texture, thickness, etc. as the type of surfacing to be installed for this project shall be provided to the Member. This must be a representative sample of the product for comparison of color and texture during installation. This sample must be submitted and approved by the Member prior to installation.
9.3.24.	Upon completion of any line markings, the Offeror shall obtain written acceptance and approval of the markings by the AEPA Member's designated representative as being complete and meeting their requirements. This document shall state that the track, basketball, or tennis court markings and layout meets and complies with the governing bodies' such as AAU, NCAA, NFHSA, State Activity Association, etc.
9.3.25.	Provide AEPA Member s with the necessary training and support services to allow their staff to conduct safety inspections, to perform maintenance according to manufactures instructions.
9.3.26.	Upon request, provide the labor, equipment, supplies and materials to inspect existing facilities and make any maintenance and repairs required to bring the facility into good working order.
9.3.27.	All material shall be guaranteed to the extent that: 1. Installed in accordance and the manufacturer's specifications. 2. Will perform as specified per the manufacturer's specifications.
9.3.28.	Quality Assurance 1. Offeror must demonstrate through documentation: 2. The products offered shall meet or exceed the American Sports Builders Association (ASBA) guidelines and all requirements of the ASBA performance specification for synthetic surfaced athletics tracks, courts and fields. 3. The Offeror will only utilize factory certified tradesmen that are licensed in AEPA Member State to perform all work performed under this RFP. 4. The Offeror shall make its' own site visit to fully acquaint themselves with the construction site, existing facilities and utilities, and shall fully understand the difficulties and restrictions attending the execution of the work under this RFP. Offeror shall advise the Member in writing and receive its' acceptance of any restrictions and/or anticipated difficulties prior to accepting a contract to do the individual project. 5. The prime Contractor shall maintain ASBA Certified Track Builder or Certified Tennis Court Builder on staff to ensure quality control in all aspects of a project conducted under this solicitation. 6. All material shall be guaranteed to the extent that the surfacing: a. Has been manufactured and applied in accordance with these and the manufacturer's specifications. b. Will hold fast and/or adhere to the asphalt, concrete, edging, filler and patches or overlay materials.

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	c. Will perform as specified in these specifications and the specifications of the product manufacturer in the current standard product information literature and specification sheets. d. Is ultra-violet resistant and will not de-laminate, bubble, blister, fade, crack or wear excessively during the guarantee period, as determined by the Member. e. That the base meets or exceeds manufacturers specifications and meets all building code requirements for drainage, sub-base and base construction requirements. f. All machinery and materials used must be only those approved by the track and field manufacturer.
9.3.29.	Outdoor Running Tracks-Track Surfacing Systems
9.3.30.	Furnish all required labor, materials, equipment, implements, parts and supplies necessary to inspect/investigate site conditions, obtain, deliver, install required track surface, line and mark track for appropriate
9.3.31.	Due to the wide range of needs and requirements of AEPA Members, AEPA is seeking track surfaces of various types and the following descriptions are given as a general guide and standard of the surfaces being requested. The Offeror is encouraged to propose a complete line of track surfaces that meet or exceed the listed surfaces and the standards and specifications established by the National Federation of State High Association, American Sports Builders Association, state and local Uniform Building Codes. The track surface will be applied by a firm licensed in AEPA Member State, which has been installing the material for the past five (5) years. Types for track surfaces to include but not limited to: 1. Pour-in-place, all-weather synthetic track surface consisting of permeable polyurethane bound rubber base mat and a structural spray coating of pigmented polyurethane and rubber. 2. Pour-in-place, all-weather synthetic track re-surface consisting of structural spray coatings of pigmented polyurethane and rubber. 3. Pour-in-place, all-weather synthetic track surface consisting of impermeable polyurethane bound rubber base mat and a solid pour polyurethane coating with rubber granules in a light encapsulating finish. 4. Pour-in-place, all-weather synthetic track re-surface consisting of a solid pour polyurethane coating with embedded rubber granule finish. 5. Impermeable polyurethane synthetic track system comprised of a base layer of polyurethane bound SBR rubber granules, an impermeable layer (seal coat) of a two-component urethane and topped with a spray-applied coating of single-component polyurethane and EPDM granules. 6. A porous, paved-in-place system, utilizing a machine installed base of single compound polyurethane binder and SBR rubber granules. The surface is finished with multiple spray applications of 100% solids, pigmented polyurethane and EPDM granules or water-based structural spray. 7. Impermeable polyurethane synthetic track system consisting of SBR Rubber, a single-component polyurethane binder and, a poured-in-place, two-component U.V. stabilized elastomeric polyurethane wearing layer with an embedded textured finish. 8. Full depth poured-in-place two component, UV stabilized elastomeric polyurethane Dual Durometer synthetic surfacing system with embedded textured finish. 9. A full depth poured-in-place two component, UV stabilized elastomeric polyurethane Tri-Durometer synthetic surfacing system with embedded textured finish and contain no SBR granulate in the system. 10. Pour-in-place, all-weather synthetic track surface consisting of polymer resin binders and rubber granules. 11. Pour-in-place, all-weather synthetic track surface consisting of polymer resin binders and rubber granules and multiple sprays of polymer resin coating.

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9.3.32.	Site Inspection and Investigation 1. The ultimate performance and lifecycle of any running/jogging track depends on a significant degree on the subsoil and drainage conditions of the site. The stability of the subsoil also has a direct influence on the ability to properly prepare the site, construct the track and to maintain design grades under the deformations generated by the construction equipment itself. Such site condition as: expansive soils or plastic soils and use of base course materials consisting of these types of soils can create problems and frost action is exaggerated where frost susceptible materials exist with moisture available to generate frost heave. It is, therefore, necessary for Offeror in cooperation with the AEPA Member in ensure that a complete and accurate site inspection/investigation has been performed to identify soil conditions existing at the site and to take these conditions into account in designing the project. Site preparation, including stripping, placement of backfill and base construction must be properly performed to minimize the risk of problems due to subsoil and subgrade conditions. a. The scope of and level of any site inspection/investigation must be flexible and dependent on the nature of the conditions that exist at a particular site, and the degree of risk that the AEPA Member is willing to acknowledge, accept and take regarding adverse effects of subsoil conditions. During the design and development of the project, the Offeror will advise and consult with the AEPA Member to determine the scope and level of site inspection required. Obviously, the more serious site conditions that require an adequate study includes, but is not limited to: i. The existence of peat or other organic soils at the site; ii. Uncontrolled fill materials or waste materials at the site; iii. Expansive soils at the site; iv. High ground water conditions or surface water retention areas (low area flooding); or v. Special usage of the facility for a variety of activities. b. Soils should be classified, in general, in accordance with the visual manual method of identification of soils, utilizing the Unified Soil Classification System (ASTM Methods D 2488 “Description of Soil Visual Manual Procedure”, and D 2487 “Classification of Soils for Engineering Purposes”). It is not intended, however, that a rigorous use of these methods be required, but only use of terminology that will describe the soil conditions in terms of soil types using the Unified Soil Classification symbols, such as CL, CH, etc. c. Data obtained from this investigation should be prepared and submitted as part of the project record documents for later reference, if necessary, or for review by a qualified engineer if an evaluation is decided upon by the AEPA Member and/or the Contractor. d. Once a site study has been completed, identified risks require the AEPA Member and the Offeror to make a joint decision as to the level site preparation is required before the project is started. This is done so that an adequate site can be available for the tract construction, and in the event of any problems developing because of subgrade conditions, the responsibility can be clearly allocated between the AEPA Member and the Contractor. e. Where any site and/or soil conditions are suspect for problems, such as existence of fill material, organic material or expansive soils are known or believed to exist at a site, then it is required that the AEPA Member and Contractor shall review, assess and discuss the pros and cons of the condition and the AEPA Member may choose to retain a geotechnical consultant to obtain samples in accordance with ASTM Method D 1587 in cohesive soils, and D 1586 in granular soils, with borings to a depth of at least 10 ft. or into firm materials. This should be followed by

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	appropriate unconfined compressions tests, water content and density determinations on cohesive soils, and penetration resistances and blows per foot for granular soils, plus water level determinations, again with borings at each corner of the tennis court or at each quadrant of the track and intermediate borings not greater than 200 ft. apart outside the pavement area. f. All information and communications relating to the site inspection and investigation shall become part of the project's documentation.
9.3.33.	Site Preparation, Earthwork, Drainage and Sub-base Construction 1. For new track construction, the site must be properly prepared in accordance with project design documents that were prepared based on the site inspection and investigation which addressed: a. Site grade and elevations; b. The sub soil, topsoil and drainage conditions; c. The existence of peat or other organic soils at the site; d. Uncontrolled fill materials or waste materials at the site; e. Expansive soils at the site; f. High ground water conditions or surface water retention areas (low area flooding). 2. If an existing athletic facility, type of facility, how is it being utilized and by whom.
9.3.34.	Stripping and excavation - Unless otherwise specified, topsoil and other unsuitable materials at the site, and to a minimum distance of 5' beyond the surfaced area, should be removed in such a manner as to minimize disturbance of the remaining subgrade soils, and to facilitate placement of embankment materials and/or base course materials. Topsoil should be stored at the site and reused for landscaping at the completion of construction.
9.3.35.	Subsurface Drainage 1. Where surface inlets are provided on or near the courts or track, drain lines to carry the water to appropriate discharge channels should be in accordance with local building codes and regulations. 2. Where it is necessary or otherwise decided to lower the water table at the site, French drains (permeable, properly graded, gravel-filled trenches), geocomposites or perforated drain lines surrounded with a stone material, should be utilized, discharging to appropriate channels. Non-woven geotextile fabric may be used, depending on the stone materials available. 3. Backfill of all trenches should be granular material, placed in layers not to exceed 6" in thickness, compacted with appropriate compaction equipment to 95% of the maximum density determined by ASTM Method D 698 (Modified Proctor). This compaction is necessary to minimize the risk of subsequent settlement of the surface over the trench. 4. When trenching or drain tile is used under existing permanent pavement, it is recommended that this area be compacted to 100% of the maximum density determined by ASTM Method D 698 (Modified Proctor). This method will reduce the amount of settlement that may occur in these trenches, which will reflect on the final surface.
9.3.36.	Sub-base Embankment 1. Embankment is fill material necessary to raise the grade at the site, after removal of unsuitable materials identified during the site investigation, to provide the surface on which to place the base course for the running track. 2. While well-graded granular soil is preferred for embankment fill, normally locally available soil is used for economic reasons. The material should be free of organic or expansive material, and of particles greater than 1 1/2" in dimension. It should be placed in lifts not to exceed 6" in thickness and compacted to 95% of the maximum density determined by ASTM Method D 698 (Modified Proctor). The water content of the fill should be reduced by aeration or increased by adding water, as necessary to achieve the required compaction.

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	3. Where the natural soil at the bottom of the sub-base course is stable, as evidenced by stability under construction equipment, hand auger or other exploration, base course materials can be placed on this soil. Soft clay and plastic soils should be appropriately stabilized.
9.3.37.	1. Vegetation control or vegetation regrowth prevention - Soil conditions vary from area to area. Where problems exist, it may be necessary to sterilize the soil. The Offeror should during project development or construction recognize and determine when soil sterilization is necessary and offer methods and options to the AEPA Member for rectifying problems caused by vegetation. a. Concrete Curbs and Drains b. Furnish all required labor, materials, equipment implements, parts and supplies necessary to prepare the site and install curbs and drainage systems. c. Cement shall conform to one of the standard specifications for Portland Cements, ASTM C-150, pr specification for blending hydraulic cements, ASTM C-595, excluding slag cements types S and SA. d. Air entrainment by total volume of concrete shall be: 4 – 6% for 1 1/2" maximum size coarse aggregate; 5 – 7% for 3/4" or 1" maximum size coarse aggregate; 6 1/2" – 8 1/2" for 3/8" or 1/2" maximum size coarse; 1/2 – 8 1/2% for 3/8" or 1/2" maximum size coarse aggregate. e. Aggregate shall conform to standard specifications for concrete aggregates ASTM C-33. For concrete work that is 5" thick, the normal size of the coarse aggregate shall not exceed 1 ½". For concrete work that is 4" thick, the normal size of the coarse aggregate shall not be greater than 1". f. Concrete work shall be 5" thick if the location of the structure is such that it will be subject to more than three freeze-thaw cycles annually. If the location is such that not more than three freeze-thaw cycles occur annually, concrete work may be 4" thick. g. Steel reinforcement bars shall conform to standard specifications for deformed and plain billet-steel bard for concrete reinforcement ASTM A-615, grade 60 or 40. h. For concrete work that is 5" thick, the recommended bars shall be No. 5 size in both directions at 12" on center. For concrete work that is 4" thick, the recommended bars shall be No. 5 size in both directions at 15" on center. Bars shall be accurately positioned at mid-depth, terminating 2" away from edges and joints, and shall be adequately supported by chairs with sand plates provided to prevent bar supports from sinking into the sub-base. i. Bars shall be lapped 18" and be securely tied or otherwise secured so that there is no possibility of displacement when concrete is placed. Reinforcement at time of concrete placement shall be free of loose, flaky rust and other coatings or films that could interfere with bonding to the concrete. j. The concrete shall have a compressive strength of not less than 3,000 psi at the 29th day after casting. The minimum cement content for finish ability shall not be less than 470 lb. per cubic yard for 1 1/2" maximum size coarse aggregate or 520 lb. for 1". In freeze-thaw environments, the minimum cement content shall not be less than 560 lb. per cubic yard. The slump shall not be more than 4". Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C-94, specification for ready-mixed concrete. k. Concrete shall be spread, consolidated, screened, bull-floated and finished in accordance with Section 7.2 of ACT Standard 302, recommended practice for concrete floor and slab construction. l. When concrete is sufficiently set to withstand foot pressure with only about 1/4" indentation and the water sheen has left the surface, the slab shall be uniformly

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	finished by power floating and trawling. The final finish texture shall have at least a medium broom finish to improve the mechanical bond to the surface. m. Immediately after brooming, the concrete shall be kept continuously moist for seven (7) days by covering with polyethylene film or waterproof curing paper. Curing compounds will not be used. Curing time shall be in accordance with surfacing systems manufacturer's recommendations, but in not less than 28 days. n. The concrete surface shall be finished so that the tolerance shall not vary more than 1/4" in 10' when measured with a 10' straightedge in all directions. o. Perimeter edging shall be constructed using one of the following methods: pavement extension, flush curb, permanent raised curb or removable raised curb. p. A pavement extension shall have an aggregate base course constructed so that the inside perimeter is parallel to and 28" inside of the track measure line, and 16" from the outer side of the outside lane line. q. A pavement extension shall have an asphaltic concrete course(s) constructed so that the inside perimeter is parallel to and 22" inside of the track measure line, and its outside perimeter parallel to and 10" from the outer side of the outside lane line. r. A pavement extension shall have a synthetic surfacing course constructed so that the inside perimeter is parallel to and 16" inside of the track measure line, and its outside perimeter parallel to and 4" from the outer side of the outside lane line. s. A flush curb shall be solid, installed for both the inside and outside (or inside only) perimeter of the trade. The curb shall be flush with either the asphalt or the top elevation of the synthetic surface for an impermeable installation. For a permeable installation, the curb is to be flush with the final elevation of the asphalt. The distance between the track side of the inside curb and the measure line shall be less than the distance between the track side of the outside curb and the line shall not be less than 4". t. A permanent raised curb shall be solid and be installed to provide a curb for both the outside and inside perimeter of the track. The distance between the trackside of the curb and the track measure line shall be 30 cm. The distance between the trackside of the outside curb and the lane line shall not be less than 4". u. Removable raised curbs shall be available in various materials, including, but not limited to: aluminum, polyurethane or aluminum with a firm rubber top. These removable curbs shall sit on pads that allow movement of water from the track surface to the drain channel or infield. v. Drainage systems shall utilize a perimeter drain tile system, catch basin, curb and gutter drainage system, permeable system or continuous trench drains.
9.3.38.	Hot mix asphaltic concrete base course and leveling course for running tracks and/or field events areas. 1. The components and methods utilized to install and complete the base and leveling course must be in accordance with the individual project's design documents. The success of any installation of base or leveling course is dependent upon a properly constructed sub-base and a good drainage system. a. Minimum recommended base course thickness shall be based on the specifications established by the geotechnical engineer. b. Minimum recommended leveling course thickness shall be based on the specifications established by the geotechnical engineer 2. Quality Assurance - For installation of running track and field event hot mix asphalt, utilize only thorough, highly-trained personnel experienced and familiar with running track and field event paving and with the tolerances required by the appropriate federal, state and local governing bodies.

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3. Asphalt - The proper type of asphalt used will vary from state to state if using the standard norm of the Department of Transportation (DOT) or State Highway Department standards. The following is a typical mix design for example only:
    a. Thickness: No less than 1".
    b. Liquid Asphalt or Bitumen: 5.5% by weight (+/- 0.5%).
    c. Asphalt Penetration or Type: 85 - 100 penetration.
    d. Cure Time: Follow coating manufacturer's recommendations (typically 14 to 30 days), depending on the time of year and rainfall. Asphalt will cure more slowly in cooler temperatures, i.e. the Spring and Fall.
    e. Aggregate Type: Crushed stone, gravel, shale, limestone, etc. Foreign materials, i.e., pyrite, clay, ferrous compounds, dirt and organic material are not acceptable.

Aggregate Sieve Analysis	% Passing
1/2"	100%
3/8"	70 – 80%
1/4"	60 – 80%
No. 4	60 – 70%
No. 8	40 – 60%
No. 12	30 – 50%
No. 16	20 – 40%
No. 30	20 – 30%
No. 50	10 – 20%
No. 100	2 – 6%
No. 200	60 – 70%
Washed	0 - 2%

    f. Plant, equipment, machines, and tools - The bituminous plant should be capable of producing the quantities of bituminous mixtures required. Hauling, placing and compaction equipment should be provided in sufficient numbers that the placement capacity at the site is equal to, or greater than, the planned plant output to the site.
    g. Paver - All pavements, where applicable, should be placed with a self-propelled asphalt paver. The screed width should be adjustable to no less than eight feet (8'). Only hydraulic screed and auger extensions to achieve widths greater than that of the main screed are acceptable.
    h. Compaction Equipment - Compaction equipment should consist of steel drum asphalt rollers of sufficient size and width to properly compact the hot mix asphalt to the required compaction, while providing a smooth surface free from bumps, marks and creases.
    i. Transportation Equipment - Transportation of the hot mix asphalt to the site from the asphalt plant should be in trucks having tight, clean, smooth beds lightly coated with an approved releasing agent. Each load should be covered with a canvas or other approved material of ample size to protect the mixture from cooling.
    j. Straightedge – The contractor should furnish and maintain at the site, in good working condition, one 10' straightedge for each paver.
4. Placement and Compaction
    a. Hot mix asphalt courses should only be placed on the specified base, free from contamination and with no free water on the surface.
    b. Paving operations should not be scheduled unless there is ample time to place, compact and finish roll the hot mix asphalt.

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	c. The range of temperatures for mixtures to be dumped into the paver should be determined by State Department of Transportation guidelines, and in no case should they be cooler than 225 degrees F. d. Paving operations should provide a mat that is smooth, dense and of the proper thickness, slope and plane. e. The leveling course should be placed such that the longitudinal joints of the leveling course are offset from that of the base course. Transverse joints should be offset a minimum of 24". f. In placing each succeeding pass after the initial one, the screed of the paver should be set so that it overlaps the preceding pass by 2" and be sufficiently high so that when compacted, a smooth joint is produced. Prior to pinching the joint, the excess material should be pushed onto the edge of the new pass with a lute. Excess material should be removed and wasted. g. Breakdown rolling should begin as soon after the placement as the mixture will allow without undue displacement. No delays in rolling should be permitted. After breakdown rolling has been completed, preliminary testing of grade, slope and planarity should be done. Any deficiencies should be immediately corrected in accordance with "Acceptability of Work." When the paving contractor is assured that all tolerances are being met, finish rolling should begin. h. Deficient areas within the base course should be corrected by saw cutting or milling high spots and/or by truing and leveling low spots. i. Deficient areas in the leveling course should be corrected by saw cutting or milling to a depth equal to the thickness of the mat. Tack coat should be applied to all edges and the pavement should be replaced. Skin patching of the leveling course should only be done with materials acceptable to the track surfacing contractor. 5. Acceptance of work – Upon completion of the work and/or prior to installing the track surface system, the base and leveling course should be inspected for: a. Grade conformance tests should be conducted on both the base course and the leveling course. The entire surface should have positive drainage. b. Planarity - After completion of the finish rolling operations on each course, the compacted surface should be tested with a 10' straightedge. Measurements should be made perpendicular to and across all mats at a distance not to exceed 25'. The track surfacing contractor and/or AEPA Member 's representative should be present when these measurements are made. The maximum allowable planarity deviation within a pass should be 1/8" in 10' when measured in any direction.
9.3.39.	Quality Assurance 1. The work shall conform to the USTC & ASBA's standards for track construction. The track surface will be applied by a licensed firm, which has been installing the material for the past five (5) years. 2. Installing foreman must have at least five (5) years' experience installing this type of system.
9.3.40.	Guarantee – The Contractor is to provide a written guarantee against defective materials or faulty workmanship, excessive color change, excessive wear, and any other feature which is not deemed ordinary wear on running tracks and court surfaces for a period of not less than five (5) years.
9.3.41.	Job Conditions – Surfacing shall not be done if a threat of freezing exists within the next 24 hours, rain is imminent, or gusting winds are forecasted. While surfacing and striping are being done, sprinkler systems must be curtailed, shut off or controlled so that no water falls on the track or event area surfaces. Other tradesmen, school district personnel and students must stay off the wet or curing surfaces.

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9.3.42.	Track systems shall be asphalt, latex, polyurethane or per manufactured rubber. Installed depth of all systems, depending on the AEPA Member requirements, will be 3/8" to 1/2". 1. Asphalt track surfacing systems shall be either a SAR or asphalt emulsion and rubber system constructed in accordance with ASBA standards. 2. Latex track surfacing systems shall be available in black or use a colored binder, color sandwich or full-depth color system. It shall be mixed and installed on-site meet or exceed ASBA standards. 3. Polyurethane track surfacing systems shall be available in either permeable or impermeable forms. They will utilize a base mat, structural spray, and sandwich or full-pour application process. The polyurethane system shall be mixed and installed onsite or per manufacturer's specifications and instructions and must meet ASBA standards.
9.3.43.	The asphalt or concrete base must be properly cured in accordance with all general specifications referenced above prior to the application of the synthetic surface.
9.3.44.	The asphalt or concrete base shall be inspected for conformity to allow tolerances for inclination. Also, the surface shall not deviate more than 1/4" in 10' from the specified grade when checked with a 10' straightedge in all directions. The surface should also be flooded with water to detect low areas. If, after 20 minutes of drying time, there are birdbaths evident, it shall be the responsibility of the AEPA Member and/or Member's representative, in conjunction with the surfacing contractor, to determine the method of correction. No cold tar patching, skin patching or sand mix patching will be acceptable.
9.3.45.	The area to be surfaced shall be clean and free of any loose or foreign particles prior to the synthetic surface installation. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. The curing time for the asphalt base is 28 days. It shall be the responsibility of the surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of polyurethane surfacing system.
9.3.46.	A primer or K coat may need to be applied to the asphalt or concrete base in accordance with the system specifications. Some systems will not require this primer coat.
9.3.47.	The track surface shall be installed in strict compliance with the manufacturer's specifications. All equipment is to be kept clean. All daily work shall be finished in a uniform manner. All cured joints are to be properly prepared prior to commencement of new work. All layers are to be properly cured prior to subsequent applications.
9.3.48.	Delaminating Surfaces – Any surfaces not adhered to the concrete or asphalt substrate need to be removed. If only a few small areas are involved, they can be patched with an appropriate compatible material. If large sections are loose and adjacent areas can be easily pulled loose, the entire surface should be removed.
9.3.49.	Striping – AEPA Member personnel will be consulted to determine the levels of competition and the governing organization's (NMAA/NCAA) standards must be utilized for the placement of the finish line(s), events to be run, location of lane numbers and any other painted markings. A computerized set of calculations will be created to enable accurate layout of the selected markings. Layout of markings will be done with a steel tape calibrated to .01". The markings on the curve will be sighted-in with a theodolite capable of direct reading to 20 seconds of arc. Markings shall conform to NFSHSA, NCAA or AAU regulations. The paint shall be semi-gloss urethane compatible with the surface. The Offeror will supply a scaled drawing of all markings. All calculations, measurements and markings will be done by qualified and experienced specialists with a minimum of three (3) years of experience in this field. All markings shall be painted, using an application process applied at approximately 200 to 250 square feet per gallon of paint.
9.3.50.	Post-Tension Concrete Tennis and/or Basketball Courts

Item	Description
	1. Furnish all required labor, materials, equipment, implements, parts and supplies necessary for, or appurtenant to, the site preparation, grading and installation of play courts (tennis and/or basketball) equal to or better than the following specifications. a. Guarantee – The contractor shall guarantee the work against defective material or faulty workmanship for a period of one (1) year from the date of completion. b. Quality Assurance – The work shall conform to the USTC and TBA's standards for tennis and/or basketball court construction. The court will be applied by a licensed firm, which has been installing the material for the past five (5) years. c. Site preparation may include removing trees, bushes and a minimum of 4" of topsoil if existing conditions require such action. The area will be graded to the required depth to accommodate the base and concrete thickness and provide a uniform 1% slope at ±.1' in one plane. All fills will be placed in 6" layers and will be compacted to 90% standard density at optimum moisture. The contractor will alert the AEPA Member of any "soft spots" or structures that could affect the stability of the slab. The site preparation will be done to provide positive drainage away from the play courts and, if needed, to provide intercepting swales to prevent drainage on to the court. The final grade base material shall be placed with automatic laser-regulated equipment capable of providing a true accurate plane to a 1/4". The depth of the fine grade base material shall be sufficient to develop 1/4" accuracy. d. Site preparation materials may consist of the existing sub-grade material unless a soil engineer specifies import fill. The fine grade base materials shall be an approved compactable, free-draining base material (sand, fine gravel, etc.). e. Vegetation control or vegetation regrowth prevention - Soil conditions vary from area to area. Where problems exist, it may be necessary to sterilize the soil. The Offeror should, during project development or construction, recognize and determine when soil sterilization is necessary and offer methods and options to the AEPA Member for rectifying problems caused by vegetation.
9.3.51.	Court paving materials specifications may include: 1. Post–tensioning and anchorages will conform to the "PTI Guide Specifications for Post-Tensioning Materials". The tensioning strands shall consist of 1/2" diameter, 7-wire, stress-relieved strands, having a guaranteed ultimate tensile strength of 270,000 psi. Strands shall conform to ASTM-416. Cables shall be fabricated to proper length for each slab, coated with a permanent rust preventative lubricant and encased in slippage sheathing. All breaks in the sheathing shall be repaired with tape prior to concrete placement. A maximum of 6" exposed strands is permitted at the dead-end anchor. 2. The concrete shall have a compressive strength of not less than 3,500 psi after 28 days. Ready-mixed concrete shall be mixed and delivered according to ASTM C-94 specifications for ready-mixed concrete with a 4" maximum slump. Mix design as follows: cement – Type 1, six sack unit weight – 140.3 lbs. per cubic foot, air entrainment – 6.0%, water/cement ration – 0.52/1. 3. Court paving execution shall consist of the following: a. Forms shall be accurately set to the lines and to +/- 1/4" of finish grade indicated on drawings and be securely staked to prevent settlement or movement during placement of concrete. Forms shall remain until concrete has taken final set. b. Tensioning cables and anchors shall be supported on chains and loosely tied 2" high at all intersections to prevent vertical and horizontal movement during concrete placement. Strands shall be placed with no greater spacing than 2'6" wide on lengths over 100' and 3'4" on lengths under 100'. After forms are removed and the concrete has set to a minimum of 2,000 psi, the tensioning procedure may be applied approximately one week later. Each tendon may

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>initially be tensioned to a maximum of 80% ultimate breaking strength and anchored at a minimum of 70% ultimate breaking strength.
<table>
<tr><td>Ultimate Breaking Strength</td><td>80%</td><td>70%</td></tr>
<tr><td>41,300</td><td>33,000</td><td>28,900</td></tr>
</table>
c. The cable ends shall be cut off and cone holes grouted flush with edge of slab. Grout shall be non-shrink grout.
d. Joints – Between each court or at net line ±1', there shall be a keyed construction joint.
e. Placing – A full court shall be placed in one continuous operation without intervening joints of any kind. The 4" thick slab will be placed with a 60' mechanical screed capable of providing a surface true to 3/8" at a 1% slope. Note: Finish surface shall not have a water-holding area greater than 1/8" deep. This is to be determined by flooding the court with water, allowing it to drain for one hour on a 70° or warmer day.
f. Curing – Immediately after finishing, the concrete shall be kept moist by covering with polyethylene, by sprinkling, by pounding or by curing compound (must be compatible with acrylic tennis surfacing material).</td></tr>
<tr><td>9.3.52.</td><td>Court Surfacing Materials
1. Playing Lines - Playing lines shall be painted per manufacturer specifications.
2. Surface will be installed per surface manufacturer specifications.
3. Court Surfacing Surface Preparation - Prior to the surfacing application, the concrete will be thoroughly cleaned by using a power broom or power washer. Subsequent to the cleaning of the court surface, a prime coat will be broom applied. Pools of the prime coat will be swept out to eliminate black "fatty" spots.
4. 1/2" Emulsion Lift - The mixture will be agitated in a mixer capable of providing a consistent and homogeneous solution of the binder and aggregates. The mixture will be screed over the entire surface using 1/2" rods; other methods of placing will not be allowed. After the lift has cured (approximately one week), it will be compacted by a vibratory roller or with a static roller weighing 3,000 lbs. The resulting surface shall be free of depressions more than 1/8" deep. Any areas holding more water than 1/8" in depth will be filled with the leveling course.
5. Leveling Course(s) - Once the 1/2" lift has been rolled, the contractor shall flood courts, mark and fill all water-holding depressions with the leveling course mixture.
6. Any remaining water-holding depressions greater than 1/8" deep will be marked and filled with the leveling mix, again using a 14' straightedge squeegee. Water holding areas will be determined by flooding the court with water and allowing it to drain for one hour on a 70° or warmer day. The court will be reflooded and refilled as necessary. Note: Water holding areas can only be removed where positive and adequate slope exists.
7. Finishing Courses - Contractor shall blend in water-holding patches and surface defects and provide for a wearing base with the finishing courses.
8. After each finishing application has been cured, any ridges will be removed with scrapers, and the application will be compacted with a minimum 3,000 lb. static roller. One finishing course will be applied and additional application will be made as necessary to provide a uniform, ridge-free surface.</td></tr>
<tr><td>9.3.53.</td><td>Hot Mix Asphalt Tennis and/or Basketball Courts
1. Guarantee – The contractor shall guarantee the work against defective material or faulty workmanship for a period of one (1) year from the date of completion.
2. Hot Mix Asphalt to meet the surface supplier specifications.</td></tr>
</table>

Item	Description
	3. Quality Assurance – The work shall conform to the USTC and TBA's standards for tennis and/or basketball court construction. The court will be applied by a licensed firm, which has been installing the material for the past five (5) years. 4. The following descriptions are given as a general guide and standard of the surfaces being requested. The Offeror is encouraged to propose a complete line of tennis/basketball court surfaces that meet or exceed the listed surfaces, the standards and specifications established by the National Federation of State High School Association, American Sports Builders Association, state and local Uniform Building Codes.
9.3.54.	Submittals 1. The Offeror must provide written documentation for each tennis/basketball surface offered, the installers authorization and certification by the surface manufacturer and licensed in the AEPA State to install, maintain and/or repair the proposed court system. 2. For the court surfaces offered, provide written documentation of its proven track record for performance and durability by listing 3 installations that are a minimum of three (3) years old that contain the same court surface materials and use the same method of installation showing locations, installation dates and owner representatives contact information. Tracks listed are to have been provided by the Offeror making a response to this solicitation. 3. The Contractor will provide at a minimum a written maintenance manual to the AEPA Member on completion of the project that includes day-to-day operating instructions, maintenance and repair methods and availability of repair materials, including cost. 4. Provide required manufacturer's Product Data and Material Safety Data Sheets for products provided. 5. For the all-weather court system proposed and/or provided under this solicitation, the Offeror must provide written documentation describing and laying out of all the terms, conditions, stipulations and requirements of the warrantee for each and any associated costs, if applicable. 6. The Offeror must provide a written proposal to the AEPA Member that includes all the necessary information required for the Member to: a. Have a complete understanding of the scope of work to be performed and timelines. b. Understand the physical layout of the proposed project in relationship to existing site conditions. c. Be aware of the type, level, quality and performance standards of products to be utilized and/or provided in completing the project. d. Understand the roles, responsibilities and commitments of all parties during the tennis/basketball construction process. e. Be aware of and understand all the costs associated to site inspection/investigation, site preparation, court construction, lining and marking the court for events and other related materials and/or construction costs.
9.3.55.	Hot mix asphaltic base course and leveling course for basketball and tennis courts. 4. The components and methods utilized to install and complete the base and leveling course must be in accordance with the individual project's design documents. The success of any installation of base or leveling course is dependent upon a properly constructed sub-base and a good drainage system. a. Minimum recommended base course thickness shall be based on the specifications established by the geotechnical engineer. b. Minimum recommended leveling course thickness shall be based on the specifications established by the geotechnical engineer.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td></td><td>
5. Quality Assurance - For installation of running track and field event hot mix asphalt, utilize only thorough, highly-trained personnel experienced and familiar with running track and field event paving and with the tolerances required by the appropriate federal, state and local governing bodies.
6. Asphalt - The proper type of asphalt used will vary from state to state if using the standard norm of the Department of Transportation (DOT) or State Highway Department standards. The following is a typical mix design for example only:
a. Thickness: No less than 1”.
b. Liquid Asphalt or Bitumen: 5.5% by weight (+/- 0.5%).
c. Asphalt Penetration or Type: 85 - 100 penetration.
d. Cure Time: Follow coating manufacturer's recommendations (typically 14 to 30 days), depending on the time of year and rainfall. Asphalt will cure more slowly in cooler temperatures, i.e. the Spring and Fall.
e. Aggregate Type: Crushed stone, gravel, shale, limestone, etc. Foreign materials, i.e., pyrite, clay, ferrous compounds, dirt and organic material are not acceptable.
<table>
<tr><th>Aggregate Sieve Analysis</th><th>% Passing</th></tr>
<tr><td>1/2”</td><td>100%</td></tr>
<tr><td>3/8”</td><td>70 – 80%</td></tr>
<tr><td>1/4"</td><td>60 – 80%</td></tr>
<tr><td>No. 4</td><td>60 – 70%</td></tr>
<tr><td>No. 8</td><td>40 – 60%</td></tr>
<tr><td>No. 12</td><td>30 – 50%</td></tr>
<tr><td>No. 16</td><td>20 – 40%</td></tr>
<tr><td>No. 30</td><td>20 – 30%</td></tr>
<tr><td>No. 50</td><td>10 – 20%</td></tr>
<tr><td>No. 100</td><td>2 – 6%</td></tr>
<tr><td>No. 200</td><td>60 – 70%</td></tr>
<tr><td>Washed</td><td>0 - 2%</td></tr>
</table>
f. Plant, equipment, machines, and tools - The bituminous plant should be capable of producing the quantities of bituminous mixtures required. Hauling, placing and compaction equipment should be provided in sufficient numbers that the placement capacity at the site is equal to, or greater than, the planned plant output to the site.
g. Paver - All pavements, where applicable, should be placed with a self-propelled asphalt paver. The screed width should be adjustable to no less than eight feet (8’). Only hydraulic screed and auger extensions to achieve widths greater than that of the main screed are acceptable.
h. Compaction Equipment - Compaction equipment should consist of steel drum asphalt rollers of sufficient size and width to properly compact the hot mix asphalt to the required compaction, while providing a smooth surface free from bumps, marks and creases.
i. Transportation Equipment - Transportation of the hot mix asphalt to the site from the asphalt plant should be in trucks having tight, clean, smooth beds lightly coated with an approved releasing agent. Each load should be covered with a canvas or other approved material of ample size to protect the mixture from cooling.
j. Straightedge – The contractor should furnish and maintain at the site, in good working condition, one 10’ straightedge for each paver.
</td></tr>
<tr><td>9.3.56.</td><td>Placement and Compaction</td></tr>
</table>

Item	Description
	1. Hot mix asphalt courses should only be placed on the specified base, free from contamination and with no free water on the surface. 2. Paving operations should not be scheduled unless there is ample time to place, compact and finish roll the hot mix asphalt. 3. The range of temperatures for mixtures to be dumped into the paver should be determined by State Department of Transportation guidelines, and in no case should they be cooler than 225 degrees F. 4. Paving operations should provide a mat that is smooth, dense and of the proper thickness, slope and plane. 5. The leveling course should be placed such that the longitudinal joints of the leveling course are offset from that of the base course. Transverse joints should be offset a minimum of 24". 6. In placing each succeeding pass after the initial one, the screed of the paver should be set so that it overlaps the preceding pass by 2" and be sufficiently high so that when compacted, a smooth joint is produced. Prior to pinching the joint, the excess material should be pushed onto the edge of the new pass with a lute. Excess material should be removed and wasted. 7. Breakdown rolling should begin as soon after the placement as the mixture will allow without undue displacement. No delays in rolling should be permitted. After breakdown rolling has been completed, preliminary testing of grade, slope and planarity should be done. Any deficiencies should be immediately corrected in accordance with "Acceptability of Work." When the paving Contractor is assured that all tolerances are being met, finish rolling should begin. 8. Deficient areas within the base course should be corrected by saw cutting or milling high spots and/or by truing and leveling low spots. 9. Deficient areas in the leveling course should be corrected by saw cutting or milling to a depth equal to the thickness of the mat. Tack coat should be applied to all edges and the pavement should be replaced. Skin patching of the leveling course should only be done with materials acceptable to the track surfacing contractor.
9.3.57.	Acceptance of work – Upon completion of the work and/or prior to installing the surface system, the base and leveling course should be inspected for: 1. Grade conformance tests should be conducted on both the base course and the leveling course. The entire surface should have positive drainage. 2. Planarity - After completion of the finish rolling operations on each course, the compacted surface should be tested with a 10' straightedge. Measurements should be made perpendicular to and across all mats at a distance not to exceed 25'. The track surfacing contractor and/or AEPA Member 's representative should be present when these measurements are made. The maximum allowable planarity deviation within a pass should be 1/8" in 10' when measured in any direction. 3. Quality Assurance a. The work shall conform to the USTC & ASBA's standards for court construction. The court surface will be applied by a licensed firm, which has been installing the material for the past five (5) years. b. Installing foreman must have at least five (5) years' experience installing this type of system. c. Site preparation may include removing trees, bushes and a minimum of 4" of topsoil if existing conditions require such action. The area will be graded to the required depth to accommodate the base and concrete thickness and provide a uniform 1% slope at ±.1' in one plane. All fills will be placed in 6" layers and will be compacted to 90% standard density at optimum moisture. The contractor will alert the AEPA Member of any "soft spots" or structures that could affect the stability of the slab. The site preparation will be done to provide positive drainage

Item	Description
	away from the play courts and, if needed, to provide intercepting swales to prevent drainage on to the court. The final grade base material shall be placed with automatic laser-regulated equipment capable of providing a true accurate plane to a 1/4". The depth of the fine grade base material shall be sufficient to develop a 1/4" accuracy. d. Site preparation materials may consist of the existing sub-grade material unless a soil engineer specifies import fill. The fine grade base materials shall be an approved compactable, free-draining base material (sand, fine gravel, etc.).
9.3.58.	Quality Assurance 1. The work shall conform to the USTC & ASBA's standards for court construction. The court surface will be applied by a licensed firm, which has been installing the material for the past five (5) years. 2. Installing foreman must have at least five (5) years' experience installing this type of system. 3. Site preparation may include removing trees, bushes and a minimum of 4" of topsoil if existing conditions require such action. The area will be graded to the required depth to accommodate the base and concrete thickness and provide a uniform 1% slope at ±.1' in one plane. All fills will be placed in 6" layers and will be compacted to 90% standard density at optimum moisture. The contractor will alert the AEPA Member of any "soft spots" or structures that could affect the stability of the slab. The site preparation will be done to provide positive drainage away from the play courts and, if needed, to provide intercepting swales to prevent drainage on to the court. The final grade base material shall be placed with automatic laser-regulated equipment capable of providing a true accurate plane to a 1/4". The depth of the fine grade base material shall be sufficient to develop a 1/4" accuracy. 4. Site preparation materials may consist of the existing sub-grade material unless a soil engineer specifies import fill. The fine grade base materials shall be an approved compactable, free-draining base material (sand, fine gravel, etc.).
9.3.59.	Guarantee – The Contractor is to provide a written guarantee against defective materials or faulty workmanship, excessive color change, excessive wear, and any other feature which is not deemed ordinary wear of an all-weather tennis/basketball court for a period of not less than five (5) years.
9.3.60.	Tennis Court Accessory Materials to include but not limited to: 1. Net Posts and Sleeves Equipment 2. Center Strap Anchor 3. Tennis Nets 4. Wind Screens 5. Backdrop Curtains 6. Court Dividers 7. Crack repair
9.3.61.	Basketball Court Accessory Materials to include but not limited to: 1. Goal Post 2. Backboards 3. Mesh nets 4. Hoop rings 18" 5. Crack repair
9.3.62.	Tracks Accessory Materials to include but not limited to: 1. Cages for Discus, Hammer, and Shot Put 2. Hammer and Discus Conversion 3. Discus Rings 4. Long and Triple Jump Take-off Systems 5. Pole Vault Boxes and Pits

Item	Description
	6. Long Jump Sandpits and Traps 7. Shot Put Toe Boards 8. Shot Put Rings 9. Throws Circles 10. Running Track Covers 11. Re-Striping Existing Running Tracks 12. Take-Off Boards 13. Water Jump Hurdle with Sleeves 14. Water Jump Cover 15. Removable Track Curbing 16. Sand – All sand for the long/triple jump sand pits shall be clean, washed, white sand, containing not more than five percent (5%) clay and shall be free of trash, organic matter, and rock. Installed sand shall meet all specifications of the IAAF – washed river sand, 0 to 2mm graining, no organic components, max 5% of weight up to 0.2mm. Prior to installation, the Offeror shall provide the AEPA Member with a one (1) gallon sample for approval.
9.3.63.	Warranty 1. All warranties will begin on the date of final acceptance by the AEPA Member. The minimum warranty for systems offered is Ten (10) years non-prorated warranty. 2. All products and services offered must be guaranteed free from defects and faulty workmanship for a minimum period of One (1) year after final acceptance by the AEPA Member. The Offeror agrees to fix, resolve, and make right any claims at no additional cost to AEPA Member during this period. 3. Contractor will pay for any failure to conform or for any defect. In addition, Contractor will fix any damage to AEPA Member controlled, real or personal property when that damage is the result of Contractor's failure to conform to contract requirements or any defect in equipment, material, workmanship, or design furnished or in compliance with federal, state and local laws, codes, regulations and standards. Contractor's warranty with respect to work done, repaired or replaced under these conditions will run for One (1) year from the date of repair or replacement or completion. 4. If Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the AEPA Member will have the right to replace, repair or otherwise remedy the failure, defect or damage at the Contractor's expense in accordance with laws of the AEPA Member State 5. Contractor will pay for any failure to conform or for any defect. In addition, Contractor will fix any damage to AEPA Member controlled, real or personal property when that damage is the result of Contractor's failure to conform to contract requirements or any defect in equipment, material, workmanship, or design furnished or in compliance with federal, state and local laws, codes, regulations and standards. Contractor's warranty with respect to work done, repaired or replaced under these conditions will run for One (1) year from the date of repair, replacement or completion. 6. If Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the AEPA Member will have the right to replace, repair or otherwise remedy the failure, defect or damage at the Contractor's expense in accordance with laws of the AEPA Member State.

Category 4 – Synthetic Turf for Playground, Pet, Commercial, Landscaping Applications

Item	Description
9.4.1.	These guidelines apply to synthetic grass for commercial or municipal landscape applications. Types of applications to include but not limited to: 1. Playgrounds 2. Landscaping

Item	Description
	3. Pet system for dog parks 4. Putting Greens and Golf Practice Tee 5. Bocce, Croquet Volleyball, Tennis Courts and Multi-use Area 6. Roofs 7. Decks and Patio 8. Non-athletic field applications 9. To cover Landfill Cells 10. Synthetic turf made from plant-based materials
9.4.2.	Components for Synthetic Turf Systems to include but not limited to: 1. Finished Pile Height form 3/8" to 2.5". 2. To have U.V. inhibitors to prevent grass from fading. 3. Seams can either be taped, glued or nailed and shall provide a resilient continuous surface over the entire project surface. 4. Synthetic Turf Types: There are several different types of synthetic turf available. They are distinguishable through the use of different fibers and different construction. Differentiated by construction are the tufted or the knitted synthetic turf systems. Both systems are comprised of synthetic fibers with primary and secondary backing systems and a resilient shock absorbing system. The shock absorbing system can consist of infill, a padding system, or a combination of both. 5. Fiber: Typically, the fiber used in synthetic turf is textured and/or non-textured polypropylene, polyester, polyethylene, nylon or other suitable performing hybrid or copolymer in tape form or monofilament. Minimum fiber sizes are 50 microns for polypropylene or polyester, 100 microns for tape form (slit-film) polyethylene, 140-300 for monofilament polyethylene (shape dependent) and 500 denier for nylon. Fiber sizes for hybrids or copolymer will comply with the most closely related fiber type. Ideally, all fibers should be of the same chemical composition, shape, and texture. Fibers should be compliant to ASTM guideline for total lead content. 6. Fiber: Typically, the fiber used in synthetic turf is textured and/or non-textured polypropylene, polyester, polyethylene, nylon or other suitable performing hybrid or copolymer in tape form or monofilament. Minimum fiber sizes are 50 microns for polypropylene or polyester, 100 microns for tape form (slit-film) polyethylene, 140-300 for monofilament polyethylene (shape dependent) and 500 denier for nylon. Fiber sizes for hybrids or copolymer will comply with the most closely related fiber type. Ideally, all fibers should be of the same chemical composition, shape, and texture. Fibers should be compliant to ASTM guideline for total lead content. 7. Primary Backing Systems Material: The primary backing materials are of a woven or non-woven fabric in one or more layers which are utilized in the tufting process, or of high strength polyester multi-filament fiber utilized in the knitting process. This backing material provides the initial dimensional stability for the system. 8. Secondary Backing Systems Material: The secondary backing materials are applied through a coating process with a single or multiple applications of one or various materials. 9. Perforations: Depending on the final construction of the turf system, the system may or may not be permeable to water. Perforations are typically required of fully coated system backings to provide adequate vertical drainage throughout the system. Some turf systems may allow for drainage without perforations by employing a process of partial coating or other system designs. Developments in coating systems have provided for lighter weight and aqueous permeable chemicals; however, the drainage criteria must be met. 10. Infill Materials: The most recent generation of synthetic turf systems utilizes a long pile height and needs to be supported with infill materials for directional stability and structural integrity, as well as resiliency. The infill materials commonly used are EDPM,

Item	Description
	TPE, natural cork, ground fibers from coconut shells, coated and non-coated silica sand, crumb and coated rubber, other suitable materials, or combinations of sand, rubber, or other suitable materials
9.4.3.	Synthetic Turf Performance 1. Traction: The surface should provide good traction in all types of weather. 2. Slip Resistance Component: The system should enable a predictable range of movement between the user and the surface uniformly throughout. The surface should balance traction and slippage by way of the sliding coefficient. 3. Surface Abrasiveness: The field surface should have fibers and infill materials that minimize skin abrasions. 4. The field surface should have the ability to adequately absorb user impact with the surface. 5. Surface Uniformity: Synthetic turf should be uniform and as level as practical. 6. Appearance: Unless otherwise dictated by design, the synthetic turf should have a consistent color, texture, and shade without significantly noticeable streaks or other irregularities when observed in any direction.
9.4.4.	Reference Specifications and Standards 1. Materials and methods of construction shall comply with the latest provisions of the following standards: 2. ASTM F1292-04: Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment. 3. ASTM D2859: Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials (Pill Flammability). 4. ASTM F1951-99: Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment. 5. Toxic Characteristic Leaching Procedure (TCLP) by Method 6010B.
9.4.5.	For all Synthetic Surfaces, provide the following information: 1. Product Data: Materials certificates, certifying each material item complies with, or exceeds, specified requirements. Certificates of compliance must be signed by materials producer and contractor. 2. Laboratory Testing Reports: Testing reports for turf material including Impact Attenuation, Flammability, Handicap Accessibility, and Lead (Pb). 3. Sample: 12" x 12" sample of turf material. 4. Warranties: Product and maintenance warranties must be provided to the Owner prior to installation. 5. Product verification: Delivery slip and item list for each material shipment, including turf and infill material. 6. Grass Installer Qualifications and certifications. IPEMA certified to install are preferred.
9.4.6.	Workmanship And Quality Assurance: 1. The artificial grass is to be installed per manufacturer's plans and specifications. 2. All artificial grass and components shall be provided by a single source.
9.4.7.	Delivery and Storage of Materials: 1. Artificial grass will be delivered in rolls 15' in length, wrapped in plastic. Rubber buffing's, performance pads, drain pads, or foam pads for under the grass will be delivered on pallets or in rolls wrapped in plastic to the job site. 2. Products will be stored in a dry, secure area. 3. Warranty of the Material and Workmanship a. The artificial grass installed under this contract will be warranted for a period of eight (8) years from the date of manufacturing against defects in material or workmanship, resulting in premature wear, deterioration and excessive fading/UV degradation during ordinary and normal use of the product(s).

Item	Description
	b. Warranty will be provided to the AEPA Member by contract holder. warranty, by the installer 4. When defective material or workmanship is discovered requiring repair or replacement, all such repair work or replacement work shall be done by the CONTRACTOR at its own expense after written notification is given of such required repairs. However, if the CONTRACTOR fails to comply with the requirements of the above guarantee within reasonable time after notification is given, the owner shall proceed to have the repairs made by others at the CONTRACTOR'S expense. 5. Any unsafe conditions that arise shall be secured and maintained by the installer until all required repairs or replacements have been completed. 6. All resurfacing will conform in kind and quality to the specifications set forth in the plans and specifications, and will be free of defects in workmanship and material.
9.4.8.	Warranty of the Material and Workmanship 1. The artificial grass installed under this contract will be warranted for a period of eight (8) years from the date of manufacturing against defects in material or workmanship, resulting in premature wear, deterioration and excessive fading/UV degradation during ordinary and normal use of the product(s). 2. Warranty will be provided to the AEPA Member by contractor. 3. When defective material or workmanship is discovered requiring repair or replacement, all such repair work or replacement work shall be done by the Contractor at its own expense after written notification is given of such required repairs. However, if the Contractor fails to comply with the requirements of the above guarantee within reasonable time after notification is given, the owner shall proceed to have the repairs made by others at the Contractor's expense. a. Any unsafe conditions that arise shall be secured and maintained by the Contractor until all required repairs or replacements have been completed. b. All resurfacing will conform in kind and quality to the specifications set forth in the plans and specifications, and will be free of defects in workmanship and material.
9.4.9.	Minimum Base Requirements per turf manufacturer specifications.
9.4.10.	Installation 1. Per turf manufacturer specifications. 2. Fall Height if required. a. Resilient safety surface – Thickness may vary according to fall height, but will typically be a depth of 4". Foam Pad or Performance Pad subsurface thickness may vary according to fall-height and may be achieved by using multiple layers of padding. 3. Protection – Surface installer shall be responsible for the protection of the resilient safety surface during the installation process. Surface installer shall be responsible for the protection of the surface during the curing period upon completion of the installation.
9.4.11.	Grooming Equipment and Supplies to include but not limited to: 1. Groomers (pull behind a utility vehicle 2. Brooms 3. Tow-behind magnet 4. Gum remover

[Freight & Delivery]

Item	Description
9.5.1.	Freight for this bid will be FOB Destination, freight prepaid and added to invoice. The Vendor Partner will maintain risk on all product until the goods are received and inspected by the Buyer. The Vendor Partner will pay shipping costs and add the cost to the Buyers invoice.

Item	Description
9.5.2.	All freight charges must be quoted to the Buyer prior to any purchase order being issued by the Buyer.
9.5.3.	A packing slip must be provided with all deliveries including the purchase order number. Orders not filled and partial shipments shall be indicated on the packing list. Buyers must be notified of an anticipated availability date within three (3) business days of receipt of order.
9.5.4.	All product, equipment, supplies and related accessories must be delivered during normal hours of operation on weekdays, unless at the convenience of the Buyer and through mutual agreement with the Vendor Partner.
9.5.5.	**Stored Materials.** Upon prior written agreement between Vendor Partner and Buyer, payment may be made for materials not incorporated in the work but delivered and suitably stored at the site or some other location, for installation at a later date. An inventory of the stored materials must be provided to Buyer prior to payment. Such materials must be stored and protected in a secure location and be insured for their full value by Vendor Partner against loss and damage. Vendor Partner agrees to provide proof of coverage and/or addition of Buyer as an additional insured upon Buyer's request. Additionally, if stored offsite, the materials must also be clearly identified as property of Buyer and be separated from other materials. Buyer must be allowed reasonable opportunity to inspect and take inventory of stored materials, on or offsite, as necessary. Until final acceptance by Buyer, it shall be Vendor Partner's responsibility to protect all materials and equipment. Vendor Partner warrants and guarantees that title for all work, materials and equipment shall pass to Buyer upon final acceptance. Payment for stored materials shall not constitute final acceptance of such materials.

10. Pricing

The Bidder must provide their pricing as requested utilizing the various pricing methodologies specified in this section. The Vendor Partner agrees that the cost for any item bid or offered on this contract will be uniform for all states, and that any differences in pricing are due to state specific installation and labor costs, AEPA Member Agency's Administrative Fee, etc. The Bidder/Vendor Partner must agree that they will offer prices equal to or better than what they ordinarily offer to individual entities or cooperatives with equal or lesser volume.

A. Line-Item Pricing: Line-item pricing is utilized when products and/or services that are broken down in detail by element, component, product categories, product type and each product and/or service is presented as an individual item which needs to be combined with other items to make up a final project or solution. The Bidder offers firm pricing for specific line items in response to this bid; a project's cost is derived by the Vendor Partner preparing and providing a quote based on the project's terms, conditions and requirements based on the line item pricing provided in the bid. The information provided in this bid for each item includes: Product Category, Product Description, Manufacturer, Manufacturer SKU, Vendor SKU, Unit of Measure, Item List Price, AEPA Bid Price.

i. **Fixed prices:** Prices bid shall be firm until each anniversary date of contract, unless there is an occurrence of one or more economic price adjustment contingencies outlined in the bid. Fixed price offers shall include prices for any and all items.

ii. **Routine Price Adjustments (Without Economic Price Adjustment):** Vendors may request adjustments to the prices twice a year at the time of renewal at the AEPA Spring and Winter meetings. Vendor Partner's must submit a fully documented written request to the AEPA Category Committee Chairperson thirty (30) days prior to the AEPA meeting. The request must specifically detail and document the cause and/or reason for price changes and include any supporting documentation (manufacturer's letter, indexes, etc.). All price changes require approval by the AEPA Member Agencies.

iii. **Unpredictable Economic Price Adjustment:** If economic price adjustment contingencies occur, Vendor Partner may submit a fully documented request (manufacturer's letter, indexes, etc.) for price adjustment to AEPA Contract Oversight Committee for review and approval by the

committee and the AEPA Member Agencies. The documentation must substantiate the cause and/or reason for the requested price increase and demonstrate that it was unpredictable at the time of bid submittal and/or contract renewal and out of the Vendor Partner's control. Pricing will take effect thirty (30) days after approval and acceptance.

iv. **New Products/Services:** Vendor Partner may submit new products or technologies that are within the original scope of work for the bid, to be added to the contract pending review and approval of the AEPA Bid Oversight Committee and AEPA Membership. Requests should be submitted to the AEPA Contract Oversight Committee thirty (30) days prior to the AEPA Winter or Spring meeting.

B. Automated System for Pricing (ASP): The method consisting of an ASP and/or software application (RSMeans, Gordian) that is self-contained and consists of a turn-key solution that includes a complete line-item listing of all of the products, supplies, materials, equipment, services, accessories and options with their description, specifications, terms, conditions and associated pricing for each item, sub-assemblies and/or assemblies. The Bidder provides a percent of discount or fixed multiplier/factor to be applied to total project cost to allow for individual state conditions and requirements and to arrive at the AEPA price.

C. R.S. Means (Construction Related Bids only): It is important for Vendor Partners to breakout all costs (quantity and price) of all items listed under R.S. Means or an Alternative Pricing method. This includes all quoted items not on the approved AEPA bid submittal.

i. R.S. Means Option for Construction Delivery Service
   a. R.S. Means is an indefinite delivery-indefinite quantity contract for construction services delivered on an on-call basis through firm, fixed price delivery orders based on pre-established unit prices for a catalog of pre-priced construction tasks. These tasks are based on local labor material & equipment. The catalog and is organized by Construction Specifications Institute (CSI) numbering system. The price of all materials include delivery to the job site including unloading, shop drawings, fasteners and normal installation. Items not included are extending warranties and sales tax.
   b. RSMeans Procurement Catalog
      - Catalog of Pre-Priced Construction Tasks
      - Labor, Material& Equipment Costs will be localized
      - The tasks represent the "Scope of Work" for the contract
      - 60,000+ tasks
      - Published for the last 77 years

ii. R.S. Means Procurement Catalog General Rules
   a. Unit price includes:
      - Complete and in-place construction - unit prices are for complete and in-place construction and include all labor, equipment and material.
      - Labor, material and equipment - for example do not add labor to masonry repointing task. Do not add bobcat for concrete side.
      - Cost of delivery to site, unloading, storage and handling. delivery height is up to 2 ½ stories.
      - Testing, calibration, balancing, etc. for new work.
      - All fasteners, bolts, anchors, adhesives, etc. for new work.
      - Tasks such as windows, doors, frames, and countertops, etc. - include sealant and caulk.
   b. Demo price includes - loading into truck or dumpster. Also, if item demolished as part of different task, it will not be paid for separately.
   c. Contractor paid for installed quantities only - no waste. Waste must be taken into account in the contractor's adjustment factor.
   d. Assembly prices - take precedence over component pricing.
   e. Working height – 14' for all work except masonry and 4' working height for masonry.

Tasks to mobilize excavation equipment, paving equipment.

f. Minimum set up charges for core drilling, saw cutting, etc.
g. Minimum charge for small area pavement repair - up to 3 tons.
h. Separate tasks for removing demolition material and waste material from site e.g. dumpsters.
i. Paid to haul imported materials, asphalt, concrete and certain other materials over 10 or 15 mile

iii. R.S. Means Procurement Catalog General Rules
   a. This pricing methodology is utilized to price a project, Contractors must use the current year and standard cost data.
   b. Only the following cost data titles will be accepted:
      - Building Construction Cost Data
      - Facilities Construction Cost Data
      - Facilities Maintenance & Repair Cost Data
      - Site Work & Landscape Cost Data

iv. What is Included in Contractor's Adjustment Factors?
   a. Include overhead, profit and administrative fee that will be added to or subtracted from the R.S. Means line item cost.
   b. Business costs include overhead, profit, management, insurance, meetings, subcontractor's overhead and profit.
   c. Project related costs include trailer, portable toilets, pm and project supervision, gang boxes, storage containers, basic safety, daily clean-up, etc.
   d. Price variations – direct costs may differ from construction task catalog. It is the contractor's responsibility to review and analyze the unit prices before bidding adjustment factors.
   e. All costs in excess of the unit prices, must be included in the adjustment factor.

v. Contractor to bid the following Adjustment Factors.
   a. Normal working hours requiring state wage rates.
   b. Normal working hours not requiring state wage rates.
   c. Other than normal working hours requiring state wage rates.
   d. Other than normal working hours not requiring state wage rates.

vi. Contractor Adjustment Factors
   a. Applies to every line item in the R.S. Means Procurement Catalog.
   b. Used to price individual work orders.
   c. Price proposal to become the lump sum work order amount.
   d. Contractor must include contract and license fee in their adjustment factor.

vii. R.S. Means Quote
   a. All work proposed under R.S. Means must use R.S. Means format, even if subcontractors are used. Subcontractor's invoices must tie to the R.S. Means spreadsheet.
   b. R.S. Means spreadsheet, which is created in the R.S. Means system, must be submitted to substantiate the quote given to the AEPA Member.
   c. R.S. Means spreadsheet must reveal the R.S. Means line number, unit of measure, cost and a sufficient amount of the description of the task to be performed. This also applies to any change orders.
   d. Pricing must be done by National Average of Location Code. For Location Code, the first three (3) numbers of the zip code will be used to determine the city location index for the AEPA Member.
   e. The AEPA contract holder factor, bonding cost, AEPA discount and taxes, if applicable, must be shown as separate line terms at the bottom of the R.S. Means spreadsheet. This information can be shown on a separate summary sheet. The summary sheet must start with the R.S. Means spreadsheet total and show the detail for each of the items stated above. This detail will be provided to the AEPA State Agency as required.
   f. All change orders will be done in the R.S. Means format using the Contractor Adjustment

Factors.

D. Alternative Method of Costing: This method covers any product and/or service not covered by catalog pricing, published price list, line-item price list, automated system for pricing, or is a product and/or service due to the projects or applications specifications, conditions and /or requirements that need to be custom designed, developed, manufactured and/or produced to meet the requirements of an individual, project or sole source. The alternative pricing is calculated as follows:

i. The Bidder must prepare, issue and receive three written quotes from available suppliers and select the supplier that offers the products and services that meet the stipulated requirements and specifications and the most cost effective solution. All quotes must be made available upon request.
ii. The Bidder must indicate the percent of overhead and /or markup as part of their response to be added to these costs to obtain the normal and customary retail price.
iii. The AEPA price is calculated by taking the product and services to cost to the Contractor plus the indicated percent of profit/overhead to equal the normal and customary retail price. The Contractor will then subtract the approved AEPA discount to obtain the AEPA price. Example: item cost $1,000; percent of profit/overhead of 20% equals retail price of $1,200; less the AEPA discount of 10% or $120 equals the AEPA price of $1,080.

E. Part F - Pricing Workbook

Pricing shall be completed on the provided pricing sheets (Microsoft Excel Workbook) with the individual tabs to be completed as follows:

i. F.1.1 Base Bid Pricing Category 1 (Required), All product offering will need to be added.
ii. F.1.2 Base Bid Pricing Category 2 (Required), All product offering will need to be added.
iii. F.1.3 Base Bid Pricing Category 3 (Required), All product offering will need to be added.
iv. F.1.4 Base Bid Pricing Category 4 (Required), All product offering will need to be added.
v. F.2.1 State Multiplier & Labor Rates Category 1 (Required)
vi. F.2.2 State Multiplier & Labor Rates Category 2 (Required)
vii. F.2.3 State Multiplier & Labor Rates Category 3 (Required)
viii. F.2.4 State Multiplier & Labor Rates Category 4 (Required)
ix. F.3.1 Volume Discounts Category 1(Optional)
x. F.3.2 Volume Discounts Category 2(Optional)
xi. F.3.4 Volume Discounts Category 3(Optional)
xii. F.3.1 Volume Discounts Category 4(Optional)

Bid pricing will be evaluated on a combination of items from both the Base Bid Pricing and State Multiplier pricing submittal. AEPA will also include as part of the evaluation process a hypothetical specified project on a site ready for installation at a specific location. Bidder must respond with pricing. This exercise will be used to compare costs between bid responses.

11. Progress Payments

Progress payments are allowed on purchases for goods and services under the following conditions: The Buyer and the Vendor Partner agree to the terms of the progress payments prior to issuing a purchase order; the purchase order describes the amounts to be paid and the date of payment; the Buyer has a satisfactory method of verifying progress described in writing in a letter or on the purchase order; that payments will only be made when actual goods and/or services are verified/received; and that any such payments be made in full compliance of Buyer's local board rules and any and all other applicable state rules and regulations.

12. Warranty

Vendor Partner warrants that all commodities, supplies, materials, equipment, software and service delivered under this contract shall conform to the specifications of this contract. All items should carry a

warranty equal to the intended life cycle or a minimum 12-month manufacturer's warranty that includes parts and labor unless otherwise specified and agreed to. The manufacturer has the primary responsibility to honor a manufacturer's warranty; a distributor or dealer agrees to assist the purchaser reach a solution in a dispute with the manufacturer over a warranty's terms. Any extended manufacturer's warranty will be passed on to the Buyer. For example, if a voice board has a three-year warranty, but the board is in a turnkey system that has a one-year warranty, the voice board's three-year warranty must be honored by the manufacturer and the Vendor Partner. All extended warranties must be passed on, without exception. If, upon discovery, the Vendor Partner charges a Buyer for a replacement part that the Vendor Partner actually received at no cost under a warranty, the Vendor Partner will rebate the amount billed and the Buyer reserves the right to cancel the contract.

13. Evaluation

The AEPA Committee for this category will evaluate bid responses based on the entire response, and according to the criteria detailed in Part A for AEPA's definition of Responsive and Responsible bids. A recommendation may be made to recommend a single response, or to recommend multiple bidders based on differentiation of product or service between bidders. AEPA will vote as a whole to accept or not accept a committee's recommendation. Once accepted, each recommended bid response will go to the individual states for contract approval. Please note, pricing evaluation may include other considerations, including the total cost of the acquisition and whether the Proposer's offering represents the best value. The evaluation committee may consider such factors as life-cycle costs, total cost of ownership, quality, and the suitability of an offering in meeting AEPA members' needs.

Evaluation Criteria
Cost Evaluation
Complete Response to Bid
Conformance to Bid Terms and Conditions
Pricing Equal to or Better Than That Offered to Individual Entities or Cooperatives With Equal or Lesser Volume
Quality and Suitability of products offered
Marketing plan
Financial Viability
Demonstrated Track Record of Performance in the public marketplace
Value Added attributes
Commitment to lead with the AEPA contract