SECTION 32 18 02

SHOCK ATTENUATION PAD SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Summary

2. Scope of Work

3. Quality Assurance

4. Qualifications and Submittals

5. Delivery, storage, and handling

6. Warranty

7. Materials

8. Execution

9. Examination

10. Installation of Shock Attenuation Pad System

11. Maintenance & Warranty

12. Maintenance Equipment

13. Maintenance Service

1.02 SCOPE OF WORK

A. The Shock Attenuation Pad is a component of the Synthetic Turf system, per Section 32 18 01. The Shock Attenuation Pad shall be furnished as part of the Synthetic Turf system, and installed by the Turf Installer contractor.

C. The selection of an Shock Attenuation Pad provider shall be done by the Owner, prior to bid, in conjunction with the synthetic turf system selection per Section 32 18 01.

1.03. DEFINITIONS

1. Owner – Property Owner (PPS or PP&R) or its designee.
2. Third Party Partner – An entity that contracts with the Owner and provides the funding for a project.
3. Designer – Architect/Engineer/Professional completing the design drawings and specifications. All Plans and Specs shall be stamped by a Professional Engineer, Architect or Landscape Architect registered in the state of Oregon.
4. Shock Attenuation Pad system - An impact energy absorbing sub-base drainage system designed specifically for use with synthetic turf.
5. General Contractor – The Bidder and contractor with the primary contract with the Owner/Third Party Partner
6. Superintendent – The primary daily on-site contact employed by the General Contractor.
7. Synthetic Turf System – All aspects of the installed field system to be used as the play surface including native soil, subgrade materials including aggregate and cement augmentation, drainage systems, Shock Attenuation Pad, tufted turf, and infill materials. See Section 32 18 01.
8. Shock Attenuation Pad Provider – The Manufacturer or Supplier of the Shock Attenuation Pad system.
9. Shock Attenuation Pad Installer – The contractor installing the Shock Attenuation Pad system. Shock Attenuation Pad Installer must be certified in writing by the Shock Attenuation Pad Provider. May or may not be the Turf Installer.
10. Grading Contractor – Contractor doing the base work. May or may not be the General Contractor/Bidder.

1. Shock Attenuation Pad – A secondary head impact attenuation layer placed between the base and the carpet. The Shock Attenuation Pad is considered part of the Synthetic Turf System.

1.03 RELATED REQUIREMENTS

A. 32 18 01 – Synthetic Turf System

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The Shock Attenuation Pad Contractor and the Shock Attenuation Pad Manufacturer must:

1. Be experienced in the manufacture and installation, in the United States of this type of Shock Attenuation Pad subbase systems for at least 5 (5) years of continuous operation for sports fields.

2. Shock Attenuation Pad Company must be an actual manufacturer of Shock Attenuation Pad subbase, not a reseller. Shock Attenuation Pad manufacturer must own its manufacturing plant and be able to control its production 100%, including lead-time and quality control.

B. Shock Attenuation Pad Installer Qualifications: Company specializing in performing the work of this section. By reference, “company”, “installer’, and “contractor” each refer to the Shock Attenuation Pad vendor.

1. The Shock Attenuation Pad Installer must provide competent workmen, skilled in this specific type of subbase installation; the installers must have installed a minimum of 10 turf fields of 65,000 square feet or more. The designated supervisory personnel on the project must be certified in writing by the Shock Attenuation Pad manufacturer as competent in the installation of this material. The manufacturer shall certify the installation and warranty compliance.

2. Shock Attenuation Pad Installer must have certified crews and may not use outside, independent contractors for the installation.

3. Shock Attenuation Pad Installer must not have had a Surety or Bonding Company finish work on any contract within the last five (5) years.

4. Shock Attenuation Pad Installer must not have been disqualified or barred from performing work for any public owner or other contracting entity in the U.S.

5. Prior to the owner approval of a specified artificial turf system, the Shock Attenuation Pad Installer shall provide a copy of the 25-year minimum, non-prorated, warranty. Warranty shall be the sole expense of the Shock Attenuation Pad Company. If the Shock Attenuation Pad manufacturer is not the same entity as the Shock Attenuation Pad installer, the warranty shall be co-signed by each.

6. The contractor shall provide evidence direct from the Shock Attenuation Pad Installer stating the installer has complied with the requirements in sections above and is certified to install this type of subbase.

C. The Shock Attenuation Pad Installer must have at least 5 years experience in the manufacture and installation of this specific type of Shock Attenuation Pad system. Prior to acceptance of contract, the installer must provide references from 5 installations within the last 3 years.

1.05 QUALIFICATIONS AND SUBMITTALS

 **Each prospective bidders and/or installers of the turf shall be required to comply with and supply proof to the engineer, contractor or owner, prior to the bid, the following information:**

1. All Contractors shall have valid Oregon CCB commercial license in good standing.
2. All Contractors shall have a COP business license.
3. All Contractors shall have Worker’s Compensation Insurance as required by Oregon CCB or have hired a sub-contractor who has obtained Worker’s Compensation Insurance.
4. Verify wage requirements prior to bid (BOLI, Davis Bacon, etc.).
5. A single General Contractor shall be hired to perform and/or manage all phases of construction. The contractor shall have a single point of contact for all onsite work.
6. The contractor shall appoint a designated Superintendent skilled in the performance of assigned duties with a minimum of 5 years of experience in supervising similar size and type of projects. Appointed individuals shall not be replaced unless the substitute individuals have equivalent qualifications and is approved by the owner.
7. See Section 01300 – Administrative Requirements for submittal procedures.
8. Submit with the bid:

1. A letter and specification sheet certifying that the products of this section meet or exceed all specified requirements, or note in each and any case, deviation from the specification and reasons for the deviation.

 Shock Attenuation Pad companies shall provide at least one bid for:

1. interlocking panel Shock Attenuation Pad as specified in this Section.

2. Provide a copy of the 25-year, non-prorated, warranty as listed below.

3. The contractor shall provide evidence direct from the Shock Attenuation Pad manufacturer stating the installer is certified by the manufacturer to install this type of Shock Attenuation Pad system.

4. The installer/manufacturer shall submit an 12-inch by 12-inch sample of the exact Shock Attenuation Pad system specified for this project.

5. The Shock Attenuation Pad Installer shall provide a list of 5 completed field installations in the last five years using this type of shock pad system.

6. Lists providing specific contacts and telephone numbers of the following:

a. A list of fields utilizing the exact specified shock pad material. Two of these fields must have been in play in the United States for at least 5 years.

1. Prior to ordering of materials:

1. The Contractor shall submit Shop Drawings indicating:

a. Field Layout

b. Shock Attenuation Pad system details

1. Prior to turf delivery, provide five sets of the following to the Engineer for approval:

1. Manufacturer’s detailed installation instructions for Shock Attenuation Pad System used.

2. Detailed equipment requirements for the Shock Attenuation Pad System supplied.

3. Manufacturer’s written warranty for materials as specified under Section 1.07, Warranty.

4. Installer’s written warranty for workmanship as specified under Section 1.07, Warranty.

5. Contractor’s insurance documentation as specified under Section 01 30 00.

6. Contractor’s bond as specified under Section 01 30 00

1. Shock Attenuation Pad materials shall not be shipped to the site without written approval from the Owner or Engineer, which will follow submittals approval.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Provide for delivery of all materials required to complete the work of this section. Store all materials in such a manner as to prevent ground contact or exposure to sun, wind, or rain. Handle all materials in accordance with the manufacturer’s recommendations.

1.07 WARRANTY

1. All Warranty language shall be submitted to the Owner for review and written approval prior to Notice To Proceed.
2. All Warranties will be guaranteed by a Warranty Bond and/or Insurance Policy. All proposed Bonds and Insurance Policies are subject to the Owner’s review and written approval prior to Shock Attenuation Pad System purchase and installation.
3. Shock Attenuation Pad System Provider Warranty: A minimum of a 25-year, non-pro-rated, warranty shall be provided by the Shock Attenuation Pad System Provider to cover any and all defects related to material failure, manufacturing, or workmanship during production and transport of the Shock Attenuation Pad to the site or location designated by the General Contractor. Warranty begins at date of Final Completion as determined by the Owner. Warranty shall also comply with the terms as outlined. .
4. General Contractor Shock Attenuation Pad System Warranty: A minimum of a 25 year, non-pro-rated, warranty shall be provided by the General Contractor to cover any and all defects, breaks or failures related to improper material storage, use of materials or equipment non-compatible with the proposed Shock Attenuation Pad system, untrained labor, or poor or non- compliant installation techniques. Additionally, an average Gmax reading of over 120 shall constitute Synthetic Turf System failure. Warranty begins at date of Final Completion as determined by the Owner. Warranty shall also comply with the terms as outlined.
5. General Contractor Maintenance Warranty for Items of Work Not Including the Shock Attenuation Pad System: Contractor shall provide a 2 year bonded warranty for all items of work completed and not directly defined as the Shock Attenuation Pad System. Contractor’s warranty and bonding obligations shall conform to the requirements as outlined in the Owner’s standard warranty language. In the instance that the Owner is the City of Portland warranty language is outline in City of Portland Standard Construction Specifications 2010, Section 150.96 Maintenance Warranties and Guarantees. In the instance in which the Owner is the Portland Public School District warranty language is outlined in Portland Public Schools, General Conditions of the Contract for Construction, Section 107.14
6. Warranties shall not exclude, at a minimum the following intended uses for the field:

1. Football

2. Soccer

3. Lacrosse

4. Marching Band

5. Physical Education Classes

6. Track and Field use including discus and javelins with protected tips.

7. Alternate Sport uses like Ultimate Frisbee, Cheerleading, etc.

8. Student gatherings and celebrations.

9. Community Events

10. Any other typical uses for synthetic turf.

11. Approved maintenance and service equipment and vehicles.

1. Warranty shall cover the use of the footwear and equipment typical for the intended uses of the field.
2. All Warranties shall cover full replacement and disposal of the replaced Shock Attenuation Pad, including repair or replacement of Synthetic Turf System components affected by replacement of the Shock Attenuation Pad. No exclusions shall apply that limit play time/use.
3. General Contractor’s Warranty shall include provisions to correct field conditions if the average G-max levels exceed 120G. Corrections shall be made at the General Contractor’s expense.
4. Shock Attenuation Pad Provider shall verify in writing that their representative has approved the installation and that the work conforms to the manufacturer’s requirements and any written directives of the manufacturer’s representative.

1.08 BONDING AND INSURANCE

A. Contractor shall provide Bonding in the following forms:

1. Payment and Performance Bonds for all work to be completed in the amount of the original contract. Follow PPS general requirements for Performance and payment bonds.

2. Bonds shall be in place prior to beginning of construction.

B. Contactor shall obtain a minimum of $1,000,000 of liability insurance per occurrence, $2,000,000 aggregate, and $1,000,000 auto insurance. Policy shall name PPS as beneficiary.

PART 2 PRODUCTS

2.01 MATERIALS

1. Shock Attenuation Pad:
2. A resilient molded expanded polypropylene base, Brock Powerbase YSR or pre-bid approved equal
3. System format: interlocking panels

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Value** | **Units** | **ASTM** |
| Thickness | 1.00 +/- 0.08 | Inch | n/a |
|  |  |  |  |
| Tensile Strength | ≥80 | Psi | ASTM D3574-08 Test E |
| Tensile Elongation | ≥30 | Percent | ASTM D3574-08 Test E |
| Compression Strength | >20 at 25% strain | Psi | ASTM 3575-08 Test D |
| Linear Thermal Expansion | <0.10 | mm/ m / °C | ASTM D696-03 |
| Thermal Resistance | ≥3.0 |  | ASTM C518 |
| Water Absorption | ≤1% after 24 hrs | Percent | DIN 534 28 |
| Vertical Permeability | >500 | Inch / hour | ASTM 1551 DIN 18-035, Part 6 |
| Lateral Transmissivity at 0.005 gradient | >0.50 | Gpm/ft | ASTM D4716 |
| Coefficient of Friction – movement of artificial turf over 50mm distance | 1.80  | Lbs | ISO 8295 |
| Head Injury Criterion (HIC) | <1000 from 1.3 m drop |  | ASTM F355-16 Missile E – single drop test |
| Gmax | <100 | G | ASTM 355-16 Missile A – single drop material test |
| Shock Absorption | >65 | Percent | EN 14808 – single drop material test |
| Vertical Deformation | <6 | mm | EN14809 – single drop material test |

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare Synthetic Turf System subgrade, subbase rock, and leveling course aggregate per Section 32 18 01- Synthetic Turf System.

3.02 EXAMINATION

A. The Shock Attenuation Pad must be inspected by the Installer, and prior to the beginning of installation, the Installer must accept the sub-base in writing.

3.03 INSTALLATION OF SHOCK ATTENUATION PAD SYSTEM

A. Install in accordance with Manufacturer's instructions. The Shock Attenuation Pad Installer shall strictly adhere to the installation procedures outlined under this section. Any variance from these requirements must be accepted, in writing, by the onsite representative of the Manufacturer/Installer, and submitted to the Owner and Engineer, verifying that the changes do not in any way affect the warranty or performance of the system.

B. The installation shall be performed in full compliance with approved Shop Drawings.

END OF SECTION