

## SECTION 32 18 23

### ATHLETIC AND RECREATIONAL SURFACING

#### PART 1 GENERAL

##### 1.01 QUALITY ASSURANCE

- A. The synthetic turf manufacturer must have a minimum of 5 years experience.
- B. The synthetic turf installer must have a minimum of 5 years experience and have installed a minimum of 5 acceptable installations of comparable size within the last 3 years.
- C. Do not apply adhesive if temperatures are expected to go below 40 degrees within a 24 hour period.
- D. Synthetic Turf Underlayment (shock pad):
  - 1. Subgrade verification: Contractor shall provide a surveyed verification of grades on a 10' grid across the synthetic turf subgrade leveling course. Local soil contour after final grading and compaction shall not have deviations in surface shape greater than ¼" over a 10' span. (+/- 1/8")
  - 2. Stringline verification: Contractor shall verify leveling course contour using "string line" method: Lengths of 50'-100' pulled taught with high/low spots marked and hand-dressed prior to installation of synthetic turf underlayment (shock pad).
  - 3. The manufacturer must demonstrate successful installations for at least 5 million square feet of the material specified herein and a minimum 10 installations within the state of Colorado.
  - 4. Use only new materials manufactured and shipped for the specific installation. No used, recycled or refurbished materials are to be installed. Manufacturer must provide documentation of material content and MSDS sheet for submittal package.
  - 5. Synthetic turf underlayment material shall be shipped as flat panels on prepackaged pallets. Pallets to be wrapped with heavy-duty barrier for protection from moisture and UV exposure. Contractor shall not unwrap packaging until installation period.
  - 6. Manufacturer shall provide written and video procedures to selected turf supplier for installation of turf over the underlayment.
  - 7. Seams shall be mechanically locked into place by hand without use of additional materials, glue, fasteners, or secondary processes and equipment.
  - 8. Install per manufacturer's guidelines.

##### 1.02 WARRANTY

- A. The warranty shall guarantee the usability and playability of the synthetic turf for its intended uses for and eight year period starting at Substantial Completion date.
- B. Synthetic Turf Underlayment (shock pad): Provide complete 25-year product warranty that includes the cost to repair or replace the turf in the event product fails to meet warranty, in the name of the District, starting at Substantial Completion date. Warranty must also include a field maximum GMax limit of 120 G's for the usable life of the artificial turf.
- C. The warranty may not be prorated or place limitation on the field's usage.

#### PART 2 PRODUCTS

##### 2.01 MATERIALS

- A. Components:
  - 1. A carpet made of polyethylene fibers tufted into a fibrous, perforated or permeable backing.
  - 2. The infill should be 100% rounded and highly uniform quartz sand, pigmented and sealed with an acrylic polymer that partially covers the carpet.
  - 3. Glue, paint, thread, seaming fabric and materials used to install/mark the synthetic turf.
  - 4. A synthetic turf underlayment (shock pad) made of resilient polypropylene.
- B. Monofilament Synthetic Turf:

1. Fiber Denier: 9,000 dtex minimum.
  2. Structure: Straight Monofilament.
  3. Yarn Thickness: 120 – 80 microns.
  4. Yarn Width: 1 mm.
  5. Yarn Tensile Strength: 135 N, Minimum.
  6. Tuft Gauge: 3/8 inch maximum.
  7. Face Weight: 45 oz. minimum. 52 oz. maximum.
  8. Pile Height (consistent throughout material):
    - a) ECE: 1 5/8 inch.
    - b) Other: 1 5/8 inch.
  9. Primary Backing: Two part composite, comprised of both woven and non-woven components.
  10. Primary Backing Weight: 8 oz/sy, minimum.
  11. Primary Backing Dimensional Stability: 47.10 n/SQ. Meter.
  12. Secondary Backing Coating: Solid polyurethane.
  13. Secondary Backing Coating Weight: 26 oz/sy, minimum.
  14. Backing Tear Strength - Grab Tear Strength: (X-Y) > 250-400 lbs.
  15. Perforated Backing: 1/4inch minimum holes at 3inch o.c. both directions.
- C. Slit Film Synthetic Turf:
1. Fiber Denier: 9,000 dtex minimum.
  2. Structure: Fibrillated Tape.
  3. Yarn Thickness: 120 – 80 microns.
  4. Yarn Width: 17 mm.
  5. Yarn Tensile Strength: 135 N, Minimum.
  6. Tuft Gauge: 3/4inch maximum.
  7. Face Weight: 45 oz. minimum. 52 oz. maximum.
  8. Pile Height (consistent throughout material):
    - a) ECE: 1 5/8 inch.
    - b) Other: 1 5/8 inch .
  9. Primary Backing: Two part composite, comprised of both woven and non-woven components.
  10. Primary Backing Weight: 8 oz/sy, minimum.
  11. Primary Backing Dimensional Stability: 47.10 n/SQ. Meter.
  12. Secondary Backing Coating: Solid polyurethane.
  13. Secondary Backing Coating Weight: 26 oz/sy, minimum.
  14. Backing Tear Strength - Grab Tear Strength: (X-Y) > 250-400 lbs.
  15. Perforated Backing: 1/4inch minimum holes at 3inch o.c. both directions.
- D. Infill:
1. Top Layer: Sealed Silica Sand
    - a) Material shall be specifically designed and manufactured for athletic use. It shall be a rounded and highly uniform quartz sand pigmented and sealed with an acrylic polymer.
    - b) The coated particles shall be smooth to resist mounding and compaction.

- c) The finished product shall be 100% coated, shall repel water, be non-flammable and have <.001% dust content.
  - d) Coefficient of Uniformity:  $\leq 1.3$ .
  - e) Sieve Size (95% Minimum): 12-20.
  - f) Angle of repose:  $\leq 30$  degrees
  - g) Abrasion Index of  $26 \pm 2$ .
  - h) Color: Green or Tan.
  - i) Acceptable Products
    - i) Environfill
    - ii) Accepted substitution: If the bidding contractor does not identify a manufacturer, the District will assume the specified product is included in the bid package and will not consider substitutions. Proposed alternate products must be submitted and re-accepted by the design architect/engineer 10 days prior to the bid opening.
- E. At sports field, carpet shall be furnished in 15' wide rolls, and shall be long enough to extend sideline to sideline without splicing.
- F. At non-sports field installations, carpet shall be in as large of pieces as practical with a minimum of seams. No seams allowed within 24inch (parallel) of edges.
- G. Synthetic Turf Underlayment (shock pad):
1. Synthetic turf underlayment shall be an impact energy absorbing drainage material specifically designed for use with syntetic turf.
  2. The material must have both impact absorption and drainage properties that meet the following performance requirements:
    - a) Vertical drainage: 50 in/hr. minimum per ENI2616
    - b) Surface contact: 50% minimum contact with synthetic turf backing.
    - c) Friction coefficient: Movement of artificial turf over 50 mm distance must require a minimum of 8.92 N of force per ISO 8295:2010.
    - d) Thermal stability: Not to exceed 3 mm per 30 degree C change.
    - e) Tensile strength: 100 psi, minimum.
    - f) Provide field maximum average Gmax of no greater than 120 during the warranty period of the turf, (system test under infill turf).
    - g) Field must pass ASTM 1292 and produce a minimum 1.3 meter (4 feet 3 inch) critical fall height. (WR Reg22).
    - h) Bacteria and fungi resistance: Pass per ASTM G22-76.
    - i) Chemical resistance: No change to material under total saturation of the following chemicals:
      - i) Gasoline
      - ii) Brake fluid
      - iii) Chlorine
      - iv) Underbody coating
      - v) Transmission fluid
      - vi) Motor oil
      - vii) Zinc chloride
      - viii) Tar and oil solvents
      - ix) Windshield washer fluid
      - x) Kerosene
      - xi) Ethylene and propylene glycols
    - j) Product must carry a 25-year product warranty that includes the removal and repair or replacement of the artificial turf in the event underlayment fails to meet warranty claims.
    - k) Material must be 100% recyclable (recycling for energy not acceptable).
    - l) Cradle to Cradle Certification preferred.
    - m) USA Made preferred
    - n) Material must not absorb water. Open cell foams not accepted.

- o) Product must be made from 100% virgin material with no recycled content.
  - p) Panel thickness: 23 mm (+/- 1 mm).
  - q) Nailer board material shall be Terrarail manufacture by Natures Composites or approved equivalent.
3. Acceptable products
- a) Brock PowerBase YSR
  - b) Accepted substitution: If the bidding contractor does not identify a manufacturer, the District will assume the specified product is included in the bid package and will not consider substitutions. Proposed alternate products must be submitted and pre-accepted by the by the design architect/engineer 10 days prior to the bid opening. Any substitutions that present a cost reduction to the owner, said cost reduction must be credited back to the Owner.
- H. Surplus Material: The turf contractor shall provide the following surplus material with each installation, to be stored at the manufacturer's or installers facility.
- 1. Turf Fabric: 5% extra by square footage.
  - 2. Seaming Tape: 5%.
  - 3. Seaming Epoxy: 5%.
  - 4. Synthetic Turf Underlayment (shock pad): 1000 extra feet
- I. Nyloplast drainage or similar systems for athletic field storm drainage systems.

**PART 3 EXECUTION**

**3.01 EXECUTION**

- A. The installation shall be performed in full compliance with the approved shop drawings.
- B. The installation shall be in accordance with the manufacturer's specifications and recommendations.
- C. Striping shall be to NFHS standards, or as shown on plans.
- D. All inlaid lines shall be straight and true.
- E. Gmax testing shall be completed following the turf installation. Testing shall be dpone at a minimum of 5 locations on the field. The average Gmax shall be below 110, with an individual maximum of 120. Testing to be paid for by the contractor.

**END OF SECTION 32 18 23**