

SECTION 02520

PLAYGROUND FALL SURFACE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Contractor shall supply all materials, labor and equipment required to install the items specified in this Section, and in accordance with the drawings and manufacturer's suggestions. Technical requirements for items listed in this section may be found in their respective sections. The following items are referenced in this section for coordination purposes:
1. Organic, loose-fill playground fall surface in areas indicated on plans.
 2. Sub-drainage layers, geotextile fabrics, wear mats, anchors and miscellaneous materials and equipment.

1.02 REFERENCES

- A. Handbook for public playgrounds safety: U.S. Consumer Product Safety Commission, 1997 or latest edition available.
- B. ASTM F 1487-95(or latest version):Standard consumer safety performance specifications for playground equipment for public use.
- C. Americans with Disabilities Act (ADA) 1990(latest version for park and playground accessibility)
- D. Texas Accessibility Standards, latest version.
- E. Impact Attenuation: According to ASTM F 1292.
- F. Accessibility of Surface Systems: According to ASTM F 1951.
- G. Minimum Characteristics for Organic Loose-Fill Surfaces: According to ASTM F 2075.

1.03 MINIMUM FALL SURFACE REQUIREMENTS

- A. Definition of Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."
- B. General: A fall zone of at least 6 feet must surround all equipment with the exception of:
- a) Swings: A fall zone equal to 2 times the height of the top rail is needed in front of and behind swings.

- b) Slides: A fall zone equal to the height of the slide plus 4 feet, extending a minimum of 6 feet, is needed in front of slide exits.
- C. Standards: All fall zones surfaces shall adhere to the References Section of these Specifications.
- D. Fall zone surfaces must be installed immediately after installing playground equipment.

1.04 WARRANTIES

- A. Supplier must provide written manufacturer's 10-year warranty against loss of resiliency.
- B. Rubber wear mats shall have a 5-year warranty.
- C. Geotextile fabric and drainage materials shall have a lifetime warranty.

1.05 RELATED SECTIONS

- A. Section 02480 – Playground Equipment.
- B. Section 02300 – Earthwork.
- C. Section 02410 – Landscape Drainage

1.06 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show the following:
 - 1. Installation details for curbs, ramps, and accessories.
 - 2. Colors and pattern of surfaces.
 - 3. Location of wear mats in organic loose-fill surfaces.
 - 4. Location of drainage accessories.
- C. Samples for Initial Selection: For each type of playground surface system indicated.
 - 1. Include similar Samples of playground surface system and accessories involving color selection.
- D. Samples for Verification: For each type of playground surface system indicated.
 - 1. Minimum 1-quart loose-fill surface sealed in a container.
 - 2. Minimum 12-by-12-inch Sample of geosynthetic fabric.
- E. Qualification Data: For Installer.

- F. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 - 1. Organic loose-fill surface.
- G. Material Certificates: For each playground surface system product, signed by manufacturers.
- H. Maintenance Data: For playground surface system to include in maintenance manuals.
- I. Warranty: See item 1.04 above.

1.07 QUALITY ASSURANCE

- A. Contractor or Subcontractor for the installation of the playground safety surface shall be one that is approved, and/or certified, by the manufacturer for installation of the specified fall surface or one that has at least (3) three years of experience in the installation of similar playground fall surfaces.
- B. Contract shall provide certificates of manufacturer warranty for each playground equipment upon notice of substantial completion.
- C. Supplier must provide a \$10 million product liability insurance certificate with project owner named as certificate holder, prior to delivery.
- D. Approved contractor for all playground structures and elements is as follows, contractor may provide alternate playground supplier/installer for approval by Landscape Architect, or Owner's Representative. <use only if there is a specific type of equipment/vendor you want to specify.
- E. Source Limitations: Obtain playground surface system materials through one source from a single manufacturer.

1.08 MEASUREMENT AND PAYMENT

- A. Stipulated Price(Lump Sum): The Contract is a Stipulated Price Contract, payment for labor, materials, and all miscellaneous costs required as part of the work required in this Section is included in the total Stipulated Price.

PART 2 - MATERIALS

2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists of acceptable manufacturers and/or suppliers, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Basis-of-Design Product: The design for each product is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.02 ORGANIC LOOSE-FILL SURFACE

- A. Engineered Wood Fibers: Random-sized hardwood fibers, in manufacturer's standard fiber size, approximately 10 times longer than wide; containing no bark, leaves, twigs, or foreign or toxic materials according to ASTM F 2075; graded according to manufacturer's standard specification for material consistency for playground surfaces and for accessibility according to ASTM F 1951.
- B. Basis-of-Design Product, Fibar system 200, or a comparable product of one of the following, or an approved equal.
1. Fibar, Inc.; Fibar System 200.
 2. GameTime; GT Impax Fiber.
 3. New England Playground Surfacing; Playground Safety Fiber.
 4. SofFall Incorporated; SofFall.
 5. Zeager Bros., Inc.; Wood Carpet.

- C. Hardwood fibers to a minimum compacted depth of approximately **12** inches.

The contractor shall utilize the following methods for determining the amount of wood fiber required: (Sq.Ft. of fall surface area X Multiplier = Volume required)

<u>Depth specified</u>	<u>Multiplier</u>	Example volume needed for an area <u>50' X 80' = 4,000 square feet</u>
14" after compaction	.064	256 Cubic Yards
13" after compaction	.058	232 Cubic Yards
12" after compaction	.055	220 Cubic Yards
11" after compaction	.051	204 Cubic Yards
10" after compaction	.045	180 Cubic Yards
9" after compaction	.041	164 Cubic Yards
8" after compaction	.036	144 Cubic Yards
6" after compaction	.028	112 Cubic Yards

- D. Supplier must provide test results for impact attenuation in accordance with ASTM F1292 Standard Specification for Impact Attenuation for Surface Systems Under and Around

Playground Equipment. Results must be provided for new material and for 12-year-old material.

- E. Testing must show “g” ratings of not more than 155g for the 8” thick system, or 120g for the 12” system at 12’ fall heights, and HIC values of less than 1,000 for both new and 12-year-old material.
- F. Supplier must provide test results in accordance with ASTM F1951 (formerly PS83) Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.
- G. Supplier must certify that the surface meets the intent of the *Americans With Disabilities Act*.
- H. Fall surface material made from softwood materials shall not be acceptable.

2.03 GEOSYNTHETICS

- A. Drainage/Separation Geotextile: Nonwoven, needle-punched geotextile, manufactured for subsurface drainage applications and made from polyolefins or polyesters; complying with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
 - 1. Weight: 4 oz./sq. yd. according to ASTM D 5261.
 - 2. Water Flow Rate: 100 gpm/sq. ft according to ASTM D 4491.
 - 3. FibarFelt or approved equal.
- B. Weed-Control Barrier: Composite fabric geotextile consisting of woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, weighing not less than 4.8 oz./sq. yd. (160 g/sq. m).

2.04 SUBDRAINAGE LOOSE FILL MATERIALS

- A. Inorganic Aggregate Materials: Clean, washed, and free of loam, clay, organic matter, debris, and other foreign substances.
- B. Medium Gravel: Rounded, hard, durable, riverbed gravel or tumbled stone, free of sand, with particle size less than 1/2 inch in diameter complying with ASTM C 136 for the following sieve analysis test results; provide minimum depth of material with critical height indicated according to CPSC No. 325: Sieve Sizes and Percent Passing through Screen: 1/2 inch passing 100 percent, 3/8 inch passing 80 percent, 5/16 inch passing 20 percent, No. 4 passing 8 percent, and No. 16 passing 3 percent

2.05 WEAR MATTING

- A. Wear Mats: Manufacturer's standard, water-permeable PVC or rubber mats tested for impact attenuation according to ASTM F 1292, and rated for use in the following locations, with anchoring system designed to anchor mat securely to subgrade through engineered wood:
- B. Provide one (1) FibarMat (minimum size: 36"x36"x1.5" rubber mat) , or approved equal under each swing, climbing and/or sliding pole, and at each ADA access point.
- C. Provide two (2) FibarMat (minimum size: 36"x36"x1.5" rubber mat) , or approved equal under each slide exit.
- D. Anchor matting securely to subbase as recommended by the manufacturer and as illustrated on the Drawings.
- E. For existing composite play equipment provide the required matting for each specified component. Actual component configurations shall govern the required amount of matting. The Drawings are for reference purposes only and may not indicate all locations where matting is required.
- F. For existing conditions where the fall surface is to remain, contractor shall excavate out fall surface material, install matting, and reinstall and compact the fall surface to the required depth and level.

2.06 LOOSE-FILL ACCESSORIES

- A. Edgings: Anchored-in-place, weather-resistant containment barrier designed to minimize sharp edges, protrusions, and tripping hazards; formed by interconnected, modular units.
- B. Anchor Stakes: Manufacturer's standard, of corrosion-resistant-coated metal or noncorrodible material, designed to be nonprotruding when installed, for connecting units and securing in-place.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Contractor shall thoroughly review the existing site conditions.
- B. Contractor shall verify that all site grading and drainage work has been properly installed and functioning correctly before beginning work.
- C. All playground equipment and safety fall surface curbing shall be in place prior to installing fall surface material

- D. Set all furnishings to the proper elevation in relation to concrete pavement and/or playground fall surface curbing and finish grades. Temporarily shore all equipment until ready to install.
- E. If playground surface is internally drain, the Contractor shall verify that all surfaces have been properly graded to drain the subbase to the proposed area drains at a minimum slope of 2%.
- F. If the playground surface is to drain to exterior weep holes in the playground border, the Contractor shall verify that all surfaces have been properly graded to drain the subbase to the proposed perimeter weep holes at a minimum slope of 2%.

3.02 INSTALLATION OF DRAINAGE

- A. Excavate area as needed with a 2% minimum grade to ensure proper drainage to drain strip. All roots, stones, and vegetation shall be removed from the safety fall surface areas.
- B. The area should be well compacted and accurately graded with no low areas or high points that would allow for puddling or obstruction to the flow of water.
- C. Install drainage inlets if applicable.
- D. If perimeter weep hole drainage is required then the Contractor shall ensure that the subbase is graded to drain to the bottom of the weep holes. If the subbase is lower than proposed weepholes, the Contractor shall import select fill and/or cement stabilized sand at no additional cost to the Owner to ensure proper subbase drainage.
- E. Cover sub-grade with geotextile fabric. Overlap all seams a minimum of 6". Lay fabric up sides of perimeter border.
- F. Cut geotextile fabric at footings of playground equipment.
- G. Securely fasten fabric at weep hole penetrations.

3.03 INSTALLATION OF WEAR MATS

- A. Install rubber wear mats in the middle of the wood fiber
- B. Wood fiber surface needs to be slightly convex to ensure that the edges of the mats do not curl up after the fiber settles.
- C. Permanently secure the mat with duckbill anchors or other approved device.

3.04 INSTALLATION OF WOOD FIBER

- A. Spread wood fiber, using a Bobcat or a small front end loader. Operator should be careful not to operate on the geotextile fabric or turn sharply on the wood fiber.
- B. Spread tighter areas by hand so as not to damage play equipment or other hard surfaces.

- C. Install wood fiber to several inches above the final grade and compact wood fiber to required depth.
- D. Feather the edges to make a smooth transition to existing grade.
- E. Avoid contamination of the fiber material with sand, gravel, mud, or native soil.
- F. Rake for a perfectly smooth, finished surface.
- G. After two weeks of active use, surface should be raked again.

3.05 MAINTENANCE OF WOOD FIBER

- A. Contractor to maintain safety fall surface and drainage during the designated maintenance period..
- B. Required maintenance items shall include, but are not limited to the following items:
 - 1. Visual Inspection: Look for debris - especially stones, broken glass or other foreign objects and remove them. Check to make sure that the level or depth of the wood fiber surface doesn't fall below the System design depth. The legs of the equipment should have been marked with a bold horizontal mark showing the System design depth when originally installed. If they are not, take the time to mark the legs with an indelible marker at the System design depth, measuring from the bottom of the wood fiber surface. If the actual depth is below the System design depth, redistribution and/or top-off is needed.
 - 2. Raking: Wear areas should be raked level and maintained at proper system design depth in inches as measured from the bottom of the wood fiber surfacing enclosure to the top of the wood fiber surface. Rake surface periodically if foreign debris such as gravel, sand, or other vegetative material accumulates on the wood fiber surface.
 - 3. Weeds: Apply appropriate post emergent herbicide to control weed growth, if applicable.

END OF SECTION 02520