

SECTION 640 - PLAYGROUNDS

640.01 DESCRIPTION

This technical provision is for the construction of a playground including assembly of play structures and equipment and installation of playground safety surfacing. It can either be for a new playground or the renovation of an existing playground.

640.02 REFERENCE STANDARDS

ADA	2010 Standards for Accessible Design
ALSC	PS 20-70 American Softwood Lumber Standards
ASTM	D1777, D-3776, D-4491, D-4533, F405, and F1487,
CPSC	Handbook for Public Playground Safety
IPEMA	Certification of having met ASTM Standards
M-NCPPC	Section 101 – Clearing and Grubbing
	Section 102 – Removal of Existing Facilities
	Section 200 – Excavation, Filling and Grading
	Section 511 – Stone Base
	Section 513 – Portland Cement Concrete

640.03 DEFINITIONS

IPEMA International Play Equipment Manufacturer’s Association. A manufacturer’s membership to IPEMA shall not constitute IPEMA certification of an individual piece of play equipment.

640.04 MATERIALS

- A. Portable Chain-Link Safety Fence. Fence shall be staked at maximum twelve (12) foot intervals and shall include all the connecting hardware. Posts shall be driven into the ground to a minimum depth of two (2) feet or secured in concrete blocks on grade. Fence shall be maintained daily. Contractor will also place “Keep Out – Playground Under Construction” signs as needed around the construction area (minimum 3 per individual area).

- B. Safety Surfacing. All surfacing should meet a minimum fall height of 10’ unless modified in construction drawings.
 - 1. Shredded Wood Fiber refers to clear chipped wood only (no softwood), and shall not include shredded bark, mulch, leaves, or branches. The product shall be an engineered product, with no artificial additives, such as “Woodcarpet” manufactured by Zeager Brothers, or an approved equal.

2. Poured-in-Place.

- a. Cushion course shall be fifty/fifty combination by weight of strand and cuboidal SRB rubber particles bonded by a 100% MDI based polyurethane binder applied to 100% of the particles. The cushion course is a precise mixture of three component parts with an installed thickness of one and half to one and three quarters (1-1/2 to 1-3/4) inches as specified.
- b. The wearing course shall be EPDM rubber granules, 1mm to 4mm chipped, bonded by a 100% MDI based polyurethane binder applied to 100% of the granules. The wearing course is a precise mixture of these two component parts with an installed thickness of 3/8 inch.
- c. The color of the surface shall be selected by the Landscape Architect after the successful bidder has been selected.

3. Rubber Tile Surfacing. Individual tiles shall be constructed from recycled post-industrial EPDM (Ethylene Propylene Diene Monomer) rubber and polyurethane. The tile shall be 4" minimum thickness to meet the critical fall height of 10'.

C. Drainage Pipe. Fibar Drain System or approved equivalent.

The drainpipe shall be a four (4) inch diameter perforated drainage pipe with gravel bedding. The drainpipe shall be high density polyethylene, corrugated on the inside and outside, four (4) inches I.D. (ASTM F-405), either perforated or plain as specified on the detail, or approved equal. The filter fabric shall be polypropylene, 3.5 oz./sq. yd. minimum (ASTM D-3776), 28 ml thick (ASTM D-1777), puncture resistance 60 lbs. (ASTM D-4833), permeability 0.40 cm/sec (ASTM D-449) minimum or approved equal. Bidder shall provide enough material to allow for twelve (12) inches overlap on all seams and three (3) inches collar on all edges. The drainage stone shall be ASTM #67 size washed stone or approved equal. All materials shall meet Section 511 – Stone Base. It shall be free of hazardous contaminants, meeting the following gradation analysis:

<u>Sieve Size</u>	<u>Specification</u>
1-1/2"	100
1"	100

D. Concrete footings. The footings, for all equipment shall be 6-1/2 bag mix, 3,500 psi Class A concrete and follow Section 513 – Portland Cement Concrete.

E. Playground Edging

- 1. Timber. The supply and installation of treated timbers for playground edging, steps and timber walls within the playground area.

- a. All lumber shall comply with guidelines established by the American Lumber Standards Committee in “PS 20-70: American Softwood Lumber Standards”. Timbers shall be pressure treated southern yellow pine or Douglas fir, S4S, No. 1 grade, kiln dried or air-dried with maximum 19 percent moisture content. The pressure treatment shall not contain arsenic. It shall be a product safe for children and the environment. Apply two brush coats of treating solution to all field cuts made after treatment.
- b. All timbers shall be thoroughly seasoned and free from warp.
- c. All rebar and hardware shall be stainless steel, hot-dipped galvanized steel or approved materials that will not corrode in contact with pressure treatment.

2. Concrete. Concrete edging shall meet Section 513 – Portland Cement Concrete.

640.05 SUBMITTALS

- A. If timber edging is used, submit wood edging sample to M-NCPPC CM for approval. Sample shall be of width and depth to be installed, minimum twelve (12) inches long.
- B. For all play equipment that has not been pre-approved: The manufacturer’s representative shall provide proof of compliance with applicable ASTM guidelines and include certification from an independent third party (such as IPEMA) which tested for compliance with relevant ASTM guidelines.
- C. Submit test results of surfacing indicating compliance with ASTM impact criteria for fall safety and ADA criteria for accessibility. No material can be placed until acceptance of the sample and colors. Submit warranty information and the following:
 1. A sample of the wood fiber and test results shall be submitted for approval to the M-NCPPC prior to installation. No wood fiber shall be spread without approval of the sample.
 2. A sample of poured in place surfacing including a sample of each indicated finish, showing texture, color, and finish.
 3. A sample of rubber tile surfacing including a sample of each indicated finish, showing texture, color, and finish.
- D. The Bidder and each proposed subcontractor must submit references reflecting that they have completed at least three (3) similar projects in the last five (5) years.
- E. Installers of the play equipment must be certified as installers by the relevant play equipment manufacturer and must provide appropriate documentation.
- F. Prior to ordering play equipment, the shop drawings shall be submitted to the M-NCPPC CM for

approval and selection of colors. The M-NCPPC CM is to be provided four (4) full and complete sets of shop drawings from the manufacturer of the play equipment. No equipment shall be ordered prior to receiving the approval of the M-NCPPC CM. The drawings will show the safety zones around each piece of equipment.

G. Contractor to supply all warranty and maintenance manuals.

640.06 QUALITY ASSURANCE

The Bidder shall satisfy M-NCPPC that he/she has been regularly engaged in the particular skills required to perform installation of play equipment and surfacing specified for at least five (5) years and have established a successful performance record of completed work on projects of similar size and nature.

The installed playground shall comply with the most current versions of the following standards, guidelines, and regulations: the U.S. Consumer Product Safety Commission’s “Handbook for Public Playground Safety”; ASTM F1487 “Standard Consumer Safety Performance Specification for Playground Equipment for Public Use; and the 2010 Americans with Disabilities Act, Standards for Accessible Design.

All surfacing must meet ASTM impact criteria for fall safety and ADA criteria for accessibility.

Playground equipment shall be provided with the following warranties:

1. For all powder coated metal components and hardware, and all vinyl coated metal components, a minimum ten (10)-year warranty against structural failure due to corrosion, deterioration, or workmanship, excluding cosmetic issues.
2. For all rotationally molded low-density polyethylene or high density extruded or molded polyethylene components, a minimum ten (10)-year warranty against structural failure due to deterioration, or workmanship, excluding cosmetic issues.
3. For all moving parts, a minimum one (1)-year warranty against failure due to corrosion, deterioration, or workmanship.

Playground safety surfacing shall be provided with the following warranties:

1. Rubber Tile Safety Surfacing. Manufacturer shall guarantee rubber tile playground surface for a period of five years against cracking, blistering, fading, discoloration, or other adverse effects from either weather or structural movement. Use rubber tile surface materials from one manufacturer and installed by a specialist. Materials shall be part of a known rubber tile sports playground system manufactured specifically for the intended use.

2. Poured in Place Playground Surfacing. Manufacturer shall guarantee poured in place playground surface for a period of five years against cracking, blistering, fading, discoloration, or other adverse effects from either weather or structural movement.

640.07 CONSTRUCTION

- A. Contractor shall erect a portable chain-link fence rental panel around all playground construction areas. This fence shall be a minimum 6' height above ground and shall be closed and locked whenever Contractor leaves the site, for any reason, or for any amount of time.
- B. For renovation of an existing playground, the Contractor shall follow Section 102 – Removal of Existing Facilities. All existing equipment, ties, footings, playground surfacing, and base materials shall be removed from the site unless Contractor has been directed to stockpile material or reuse the existing ties. All demolished equipment shall be removed from M-NCPPC property the day it is demolished. Partially demolished equipment shall be behind the chain link fence.
- C. The Contractor will follow Section 200 – Excavation, Filling and Grading to obtain proper grades for playground area.
- D. Playground Installation. Install all the equipment and site amenities per the manufacturer's details, specifications, and/or supervision. Refer to the plans and shop drawings for the exact configuration of each structure and the placement within the playground.
 1. The footings dimensions shall be a minimum 42" below grade. The top of the footings shall be backfilled with four (4) inches clean dirt, and this elevation will be the top of the subgrade on which the wood chips shall be spread by the Contractor.
 2. All playground equipment and layout of the structures, play surface, edging and other site features (benches, trash receptacles, bike racks, etc.) shall be installed per the manufacturer's specifications and shall comply with the most current versions of the following standards, guidelines, and regulations: the U.S. Consumer Product Safety Commission's "Handbook for Public Playground Safety"; American Society for Testing and Materials F1487 "Standard Consumer Safety Performance Specification for Playground Equipment for Public Use; and the 2010 Americans with Disabilities Act, Standards for Accessible Design. Safety zones will be indicated on the plans for each project and shall always be maintained. Violation of these safety zones will be cause for rejection of the work. The footprint of the equipment ordered shall fit the footprint of the equipment as shown on the plans.
 3. The Contractor shall survey and stake the layout of all edging, play equipment, play equipment use zones and other site features in the field prior to construction to ensure that equipment clearances and safety zones are adequate. Layout may be modified

slightly during field review. Stakes shall remain in place during construction as guides for the finished work.

4. Provide permanent markings on all posts to indicate proper level of playground safety surface for future maintenance purposes. Provide weep holes or other means for evacuation of entrapped water in hollow sections of metal members as necessary.

E. Supply and Installation of Edging. **The edging around the playground shall be installed only after the equipment is installed.** The edging must be out of the playground fall zone.

1. Timbers shall be dressed smooth all sides with top edges routed with a round over bit to give a smooth radius with no sharp edges. Minimum length of timber in place shall be 4' and shall have a minimum of two (2) rebar per timber. All joints shall be butted tight, with any gaps filled.
2. Countersink and plug all hardware to prevent injury. Horizontal timber edging shall be installed per the details on the plans. All rebar ties shall be countersunk into timbers and plugged with metal cap. Hardware shall be countersunk to prevent injury and capped.

F. Supply and Spreading of Shredded Wood Fiber Safety Surface.

1. Shredded Wood Fiber shall be compacted to twelve (12) inch depth. Wood fiber shall be spread evenly by handheld rakes and compacted, in accordance with manufacturer's recommendations. The top of the wood fiber shall be one uniform level, and at a twelve (12) inch minimum compacted depth under the equipment and covering the top of equipment footings.
2. A Fibar drain system (or equal) shall be installed under the wood fiber and be installed per the detail on the drawing. Once drainage is installed, install the engineered wood fiber in layers, 6-8" at a time. Rake, level and wet the surface before compacting with a mechanical compactor after each layer is installed. Change direction 90 degrees between each layer. Repeat these steps until the twelve (12) inch depth is achieved.

G. Supply and Installation of Poured in Place Surfacing.

1. Supply and install poured in place surfacing with the depth required for the maximum fall height of equipment shown on plan. Install surfacing system when minimum ambient temperature is forty (40) degrees F and maximum ambient temperature is ninety (90) degrees F. The wearing course is hand troweled to produce an even, uniform surface. Transition edges to be beveled or flush. The finished resilient rubber playground surface system shall be seamless.
2. Use poured in place playground surface materials from one manufacturer and installed by a specialist. Materials shall be part of a known rubber sports playground system

manufactured specifically for the intended use.

3. Test in-place resilient sports surfacing for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by M-NCPPC CM.

H. Supply and Installation of Rubber Tile Surfacing.

1. The tile shall be adhered to a concrete base per the manufacturer's details, specifications and supervision.
2. Installation performed only by specialists with specific experience in the installation of a rubber tile surfacing system. Refer to the plans and shop drawings for the exact configuration of each structure and the placement of the tiles within the playground. Submit sample of each indicated finish, showing texture, color, and finish.

I. Supply and Installation of Underground Drainage System.

1. Underground drainage system purpose is to catch and direct runoff to drainage pipe. The FibarDrain (or approved equal) baffled, poly drain system (minimum flow rate of 10 gpm/ft.) shall be wrapped in filter fabric. The filter fabric shall be polypropylene, 3.5 oz./sq. yd. minimum (ASTM D-3776), 28 ml thick (ASTM D-1777), puncture resistance 60 lbs. (ASTM D-4833), permeability 0.40 cm/sec (ASTM D-4491) minimum or approved equal. Bidder shall provide enough material to allow for twelve (12) inches overlap on all seams and three (3) inches collar on all edges.
2. An alternative to the FibarDrain system is to install a 4" minimum depth layer of washed river gravel under the entire safety surface. Subgrade at the bottom of the gravel bed shall be sloped toward the under drainpipe. Gravel shall be wrapped completely in filter cloth, with a minimum twelve (12) inch overlap. The drainage stone shall be ASTM #67 size washed stone or approved equal. All materials shall meet Section 511 – Stone Base. It shall be free of hazardous contaminants, meeting the following gradation analysis:

<u>Sieve Size</u>	<u>Specification</u>
1-1/2"	100
1"	100

3. Gravel shall be wrapped completely in filter cloth with a minimum twelve (12) inch overlap.
4. Supply and Installation of 4" Diameter Perforated Drainage Pipe with Gravel Bedding. Gravel shall be wrapped completely in filter cloth with a minimum 12" overlap.

J. At the end of construction, the maintenance kit, that is supplied by the manufacturer with

each structure that is installed, shall be relinquished by the contractor to M-NCPPC CM as the owner of the equipment. This kit includes owner's manual, spare hardware, spare parts, special tools and touch-up paint.

413.08 MEASUREMENT AND PAYMENT

Payment will be full compensation for all material, labor, equipment, tools, and incidental items necessary to complete the work. Payment will be made only after final inspection by the M-NCPPC playground inspector. Payment shall be made on a unit rate or lump sum basis as shown in the bid proposal.