

## SECTION 00 91 00

### PLAYGROUND STANDARDS

#### PART 0 - PURPOSE

- A. Describe broad guidelines for design of schools.
- B. Establish materials qualities and applications.
- C. Describe materials and conditions which do not easily fit into specific specification sections.
- D. See specific sections of Design of Construction Standards for additional requirements.

#### PART 1 - SAFETY: SAFETY REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM) designation F 1487 – 98 (or current issue) “Standard Consumer Safety Performance Specification for Playground Equipment for Public Use”
  - 1. U.S. Consumer Product Safety Commission (CPSC) “Handbook for Public Playground Safety” (Publication No. 325) (based on ASTM F 1487) Internet address: [www.cpsc.gov/CPSC/PUBS/325.pdf](http://www.cpsc.gov/CPSC/PUBS/325.pdf)
  - 2. CPSC “Playground Surfacing Materials” (Publication No. 3005)

#### PART 2 - GENERAL

- A. Safety surfacing shall be installed under all play apparatus and within all play apparatus fall zones, use zones, and safety zones.
- B. Safety surfacing materials shall have a Critical Height value (see CPSC guidelines) of at least the height of the highest accessible part of the play apparatus.
- C. DPS Operations and Maintenance will provide engineered wood fiber (EWF) maintenance tools for each site, including “corn cob forks” and “clam rakes.”

#### PART 3 - UNACCEPTABLE SAFETY SURFACING MATERIALS

- A. Sand.
- B. Wood chips, bark mulch, or wood mulch not certified by ASTM.
- C. Any type of gravel including squeegee.
- D. Loose mats (except “wear mats” indicated below).

#### PART 4 - ENGINEERED WOOD FIBER (EWF) SAFETY SURFACING

- A. EWF system design:
  - 1. Depth of EWF:
    - a. Minimum compacted (aged and used 90 days) depth of EWF is 12” in all safety surfacing areas.
    - b. Initially install EWF to a minimum depth of 15” in all playground areas requiring safety surfacing. It is anticipated that the EWF will compact over time to the minimum required 12” depth.
  - 2. Drainage layer beneath EWF:
    - a. Provide a minimum 3” deep layer of drainage rock beneath the entire EWF surface.
    - b. The subgrade beneath the drainage layer shall be designed to direct water to a storm water drainage system.
  - 3. Containment of EWF:
    - a. Design perimeters of EWF areas with a minimum curb height of 4” and a maximum curb height of 6” above the surface of the compacted EWF.

- b. Do not include geotextile fabric between the drainage layer and the EWF material.
  - c. Geotextile fabric needs to be placed between compacted subgrade and drainage layer, as well as wrapping any drainage material associated with a dry well system.
4. Ramps
- a. Landscape Architect or Civil shall design ramps for accessible transitions between play area perimeters and surface of EWF. Refer to the play pit ramp drawing.
  - b. In some circumstances, it may be necessary to use a resilient safety surface other than EWF for access path surfacing. In this case poured-in-place surfacing may be specified.
5. Access
- a. All EWF pits need to be accessible by the Grounds Department’s maintenance trucks for the delivery of materials and future maintenance.
- B. Drainage System Design: Site Drainage
- 1. EWF drainage system shall be designed by the Landscape Architect or Civil Engineer.
  - 2. The Landscape Architect or Civil Engineer shall design a subsurface drainage system sufficient to prevent standing water in EWF areas.
  - 3. Design drainage system to remove a 3 inch rainfall within 4 hours.
  - 4. Design drainage system so that no free water remains 12 hours after precipitation ends.
- C. Certifications:
- 1. The architect is to pull the current standards for the playground equipment and fall zones at the time of design and apply those to the design and specs.
    - a. EWF and resilient tiles or poured-in-place material shall meet impact attenuation requirements of ASTM F 1292 - Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.
    - b. Meet requirements of ASTM F 1951, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.
    - c. Meet accessibility requirements of the ADAAG.
- D. Submittals (provided by Supplier to Playground Designer and DPS):
- 1. Product Data:
    - a. Submit product data for poured-in-place safety surfacing.
- E. EWF System Material Specifications:
- 1. Acceptable EWF Systems:
    - a. “Fibar”.
    - b. “Soft Fall / Soft Step”.
    - c. “Woodcarpet”.
    - d. or pre-approved equivalent.
  - 2. Resilient Tiles Or Poured-In-Place Material:
    - a. Playground Designer shall research and specify current available products.
    - b. Thickness shall be determined by manufacturer, as appropriate to fall height and to meet certification requirements noted above.

## **PART 5 - PLAY APPARATUS**

### **A. Overall Design Criteria:**

1. Play apparatus standards apply primarily to elementary school level playgrounds, for children through 12 years of age. If play apparatus is designed for middle school or high school level students, minimum requirements contained in this standard shall apply.
2. Separation of play apparatus in separate pits and by age group is recommended. Combinations of composite play structures and individual elements of play apparatus are anticipated.
3. Accessible play elements shall be integrated into every play area.

### **B. Safety:**

#### **1. Safety Certifications:**

- a. Design, materials and installation shall be in accordance with ASTM F 1487-98, including associated CPSC Guidelines.
- b. Manufacturer's certification: A manufacturer's representative shall provide an on-site inspection and written certification that play apparatus has been installed according to specifications, including safety surfacing.

#### **2. Safety Zones, Fall Zones & Use Zones:**

- a. Determined by Playground Designer and Manufacturer.
- b. Shall be indicated for both existing and new play apparatus.
- c. Shall be indicated on construction drawings.
- d. Shall be indicated on manufacturer's shop drawings.

### **C. Accessibility:**

#### **1. Certifications:**

- a. Play apparatus identified as accessible shall be in accordance with the ADAAG.

#### **2. Wheelchair Transfer Points:**

- a. Grade level access surface and transfer platform, steps and ramps on play apparatus shall be large enough to be useful. Meet minimum dimensions recommended by accessibility standards referenced above.
- b. If feasible, locate wheelchair transfer points in close proximity to the bottom of slides.
- c. A primary goal should be wheel chair access of play equipment without the need to transfer from the wheelchair.

#### **3. Accessible Paths Within Composite Play Apparatus Structures:**

- a. Meet minimum dimensions recommended by standards referenced above.
- b. Consider the possibility that a mobility impaired student may be able to crawl up steps from the transfer platform. Maximum four steps are allowable from one platform to another.
- c. Where a wheelchair accessible ramp is provided for access onto a composite play structure, a continuous accessible route shall be provided to another accessible exit from the play structure. Where a separate accessible exit is not feasible, a platform of sufficient size shall be provided to allow a student using a wheelchair adequate space to turn around in order to exit.

#### **4. Building Access To Playground:**

- a. Design at least one ADA ramp from the asphalt playground (if one doesn't exist) to a building entry point.

### **D. Heights Of Play Apparatus:**

1. General:

- a. Playground Designer shall design apparatus “fall heights” to meet “critical height” limitations of safety surfacing materials. Refer to CPSC Handbook Table 1.
  - (i.) On all DPS playgrounds, safety surfacing is to be installed at minimum compacted depth of 12 inches.
- b. “Critical height” of safety surfacing is defined in the CPSC Handbook part 4.2.
- c. “Fall heights” of equipment are defined in CPSC Handbook part 4.3.
- d. Maximum heights for DPS play apparatus:
- e. In addition to apparatus height limitations recommended by the CPSC Handbook, DPS recommends the following maximum play apparatus heights:
  - (i.) Pre-Primary (Ece) And Primary Play Apparatus Maximum Heights:
    - Maximum platform or access height: 1’-0” lower than recommended height in CPSC Handbook
    - Height of swing set top rail:
      - Pre-primary (ECE): 1’-0” lower than recommended height in CPSC Handbook.
      - Primary: 8 feet.
  - (ii.) Intermediate Play Apparatus Maximum Heights:
    - Maximum platform or access height: 8 feet.
    - Height of swing set top rail: 8 feet.

E. Playground Safety Signs:

- 1. The playground apparatus manufacturer shall provide a permanent sign at each play area that indicates the age groups that the play apparatus is designed to accommodate.

F. Specific Play Components:

- 1. Sand Box / Sand Table:
  - a. Strongly recommended for every elementary level play area.
  - b. Provide raised area to allow student in wheelchair to transfer into sandbox.
  - c. Provide shade over portion of play sand area.
  - d. Design must provide custom fit cover for sand pit to meet health code requirements. (example: Sandlock).
  - e. Provide straps or stakes at midpoints to retain shape of sandbox.

G. Play Sand:

- 1. Application:
  - a. Use for sandboxes only.
- 2. Specifications:

<u>Sieve</u>	<u>% Passing</u>
#4	100%
#8	40-85%
#16	0-30%
#200	0-2%

- 3. Slides:

- a. Slides (except spiral slides) shall face north.
  - b. No covered slides.
4. Activity Panels:
- a. Unacceptable types of activity panels include:
    - (i.) Activity panels that contain only painted graphic images.
    - (ii.) Panels containing clear acrylic windows or mirrors.
  - b. Acceptable types of activity panels include:
    - (i.) Steering wheels.
    - (ii.) Tic tac toe games.
    - (iii.) Games such as picture match, number sequences, shape and color sequences.
5. Swings:
- a. Provide a minimum one accessible swing at each playground.
  - b. An accessible swing should not share a bay with a standard swing.
6. Non-traditional Play Elements:
- a. Non-traditional play elements such as logs, boulders, mounds, etc. are encouraged for playgrounds, provided they comply with DPS and CPSC safety standards.
  - b. Boulders (real or manufactured), logs, and non-traditional climbing equipment within playgrounds shall be considered as individual pieces of play apparatus. Provide safety surfacing. Provide safety zones and fall zones per CPSC guidelines.
  - c. Any artificial rock/boulder shall not have a hollow cavity whereby students can hide in or become trapped in.
- H. Minimum Apparatus Requirements To Promote Developmental Skills: Coordinate with DPS.
- 1. New play apparatus shall be provided to promote specific developmental areas, including: gross upper body, gross lower body, fine motor, social, imaginative and cognitive skills.
- I. Play Apparatus To Avoid:
- 1. Track rides, track slides.
  - 2. Roller slides.
  - 3. Open bed slides 8 feet high.
  - 4. Multi-occupant swings.
  - 5. Rope swings.
  - 6. Merry-go-rounds.
  - 7. Seesaws and teeter totters.
  - 8. Trampolines.
  - 9. Gliders.
  - 10. Solid-wall crawl tubes.
  - 11. Triple shot/ Triple shootout from Playworld systems.
  - 12. Certain Types of Dome climbers that lack support in the middle and bend down. Example would be the super satellite from Playworld systems.

13. Rope climbers.
14. Diggers without stop pins (only allow 180 degrees of rotation).

J. Existing Apparatus:

1. Evaluation:

- a. Playground Designer shall evaluate existing apparatus that may be affected by a construction project. Evaluation shall be relative to these standards.
- b. Evaluation will be used to determine whether individual pieces and assemblies of play apparatus should be left untouched or modified in place, relocated, or demolished.

2. Relocation:

- a. When it is feasible to relocate existing play apparatus, responsibilities for removal, modification, and reinstallation shall be clearly indicated by the Landscape Architect or Civil Engineer in the construction documents.
- b. DPS Maintenance will be assigned the responsibility of relocating or modifying existing play apparatus only with prior approval of DPS.

3. Modification:

- a. When it is feasible to modify existing play apparatus, the Landscape Architect or Civil shall assure that the designed modifications meet all current applicable safety and accessibility guidelines and requirements.

4. Traveling Rings (also called “Ringers” or “Giant Stride”)

- a. This type of play apparatus is no longer manufactured.
- b. Do not relocate traveling rings.
- c. If new steps are needed for traveling rings, steps will be provided by DPS Maintenance.

5. Unacceptable Materials:

- a. Wood.
- b. Concrete.
- c. Rubber vehicle tires.
- d. “Home made” apparatus that do not meet DPS and CPSC standards.

6. Materials And Fabrication:

a. Support Posts, Uprights:

(i.) Material: Galvanized steel, minimum 12 gauge:

- Yield strength: 55,000 psi
- Tensile strength: 50,000 psi

(ii.) Size: Minimum 4 1/2” outside diameter (5” outside diameter preferred):

- Smaller diameters may be approved for Pre-Primary (ECE) playgrounds only, and only by DPS approval.
- Note: No posts on DPS sites shall be smaller than 3-1/2” diameter.

(iii.) Finish: Baked on, polyester powder coated paint:

- Epoxy or hybrid paint is not acceptable.

b. Other Structural Members, Including Handrails And Guardrails:

(i.) Material: Galvanized steel.

- (ii.) Size: Diameter of steel tubing will vary according to manufacturer's recommendations. Minimum 1 5/16" outer diameter.
- (iii.) Finish: Baked on, polyester powder coated paint:
  - Epoxy or hybrid paints not acceptable.
  - On handrails, textured or knurled surfaces are preferred for better grip.
- c. Plastic Components:
  - (i.) Material: Rotationally molded, linear, low density polyethylene with UV inhibitors.
  - (ii.) Minimum wall thickness: 0.250" (Except as allowed for roofs).
- d. Decks, Including Platforms, Ramps, Walking Surfaces, Bridges, Slide Ladders:
  - (i.) Vinyl coated.
  - (ii.) Fully welded.
  - (iii.) Perforated 12 gauge steel horizontal surfaces.
- e. Slides:
  - (i.) One piece double wall plastic (two pieces acceptable for 8' high slides).
  - (ii.) Stainless steel preferred, minimum 16 gauge, if budget allows.
- f. Chain:
  - (i.) Vinyl coated galvanized steel.
  - (ii.) Chains for swings shall NOT be vinyl coated.
- g. Roofs:
  - (i.) Metal preferred, for durability.
  - (ii.) Rotationally molded plastic acceptable.
  - (iii.) Tensile fabric on a case by case basis.
- h. Hardware, Accessories, Fittings:
  - (i.) Post Caps:
    - Cast aluminum.
    - Finish: Baked on, polyester powder coated paint.
      - ◆ Epoxy or hybrid paints not acceptable.
  - (ii.) Clamps:
    - Cast or die cast aluminum or stainless steel.
    - Finish: Baked on, polyester powder coated paint.
      - ◆ Epoxy or hybrid paints not acceptable.
  - (iii.) Fasteners:
    - All fasteners shall be tamper-proof stainless steel.
    - All nuts shall be lock nuts.
    - Lock nuts shall have safety caps.
  - (iv.) Permanent Labels:
    - Apply to apparatus, or on sign close to apparatus.

- Identify play apparatus manufacturer.
- Include appropriate safety warnings.
- Indicate age appropriateness of equipment.

(v.) Elevation Of Safety Surfacing:

- Manufacturer shall permanently mark optimum safety surfacing grade level on every post. Marking shall be a simple line and shall not be identified.

7. Installation

- a. Landscape Architect or Civil Engineer and Installer shall ensure that all potential underground utilities and structures are located prior to digging.
- b. Installer shall verify that sub grades are properly prepared and compacted.
- c. Beginning of installation indicates acceptance of existing conditions.
- d. Installer shall field verify locations of all apparatus with DPS representative before proceeding with installation.
- e. Installer shall provide concrete footings to dimensions indicated by play apparatus manufacturer.
  - (i.) Concrete shall meet DPS standards.
- f. Protect all excavations from erosion and flooding during apparatus installation.

**PART 6 - OTHER PLAYGROUND LANDSCAPE COMPONENTS**

A. Edges And Containment:

1. Fences:

- g. Refer to DPS specifications Site work, and Chain Link Fencing.

2. Curbs:

- a. Playground Designer shall design retaining curbs at perimeters of EWF, squeegee.
  - (i.) Top of curb shall be minimum 4 inches above finished surface of material to be contained.
- b. Curbs shall be cast-in-place concrete
- c. Play pit design shall not have any shape that renders portions of the play pit unsuitable for play equipment placement.

B. Walks And Paving:

1. Some schools need sidewalks within playgrounds for tricycles and other rolling play equipment.
  - a. If sidewalks are placed for rolling play equipment consider wavy walks and rumble strips
    - (i.) If wavy walks are used ensure the play area and walk are still ADA accessible.
  - b. Sidewalks are to be designed to DPS standards
2. Avoid use of asphalt for sidewalks.
3. Refer to DPS Standards Division 32 Sections for additional requirements.

C. Plant Materials:

1. Refer to DPS Standard Specification 32 90 00 – Plantings.

D. Irrigation:

1. All plant materials on all DPS sites shall be irrigated by automatic irrigation systems. Refer to DPS Specification 32 84 00 for irrigation system standards.



E. Water

1. Exterior drinking fountains are discouraged on DPS sites.
2. If possible, locate student playgrounds close to building entrances where interior drinking fountains may be accessed easily.
3. If water play features are desired, the Playground Designer shall coordinate all such designs with the DPS. Standing water will not be allowed in water play features. Safety and long term operations and maintenance considerations will prevail over other design considerations.

F. Landscape Furnishings:

1. Refer to DPS Standard 32 40 21 – Site Furnishings.
2. Place site furnishings on pavement or other inorganic surfacing.

G. Bicycle Parking:

1. Need and requirements to be determined by individual schools. Not mandatory, except as required by Denver Zoning Administration.
2. Refer to DPS Standard 32 40 21 – Site Furnishing.

H. Athletic and Recreation Equipment

1. Architect shall coordinate with DPS the sports to be played at each school.
2. Architect shall coordinate recreation program requirements with DPS for each school.
3. Architect shall coordinate with Education Specification for quantity and size of equipment, playing fields and courts not covered in the Playground Standard.
4. Architect shall coordinate with DPS Section 32 18 23.
5. Both outdoor and indoor playgrounds are possible. Coordinate with DPS Playground Standard 32 18 23 for guidelines.
6. Architect shall coordinate layouts, power supply, and mounting requirements for all FF&E items purchased by DPS related to this section, i.e. cardiovascular equipment.
7. Architect to coordinate requirements of a Learning Landscape with DPS.
8. Architect shall coordinate equipment design with accessibility (ADA) requirements and applicable codes.
9. Equipment shall be age appropriate, and may require physical separation of ages.
10. Architect shall coordinate all equipment design with DPS Playground Standard 32 18 23.
11. Architect shall coordinate school colors and logos for incorporation into project.
12. Architect shall coordinate floor anchorage and in-floor mounting requirements for all indoor equipment with area to be used.
13. Architect shall provide for proper structural blocking and support for all indoor mounted equipment.
14. Architect shall coordinate in-floor mounting and power requirements of equipment.
15. Architect shall coordinate requirements of game striping and sizing, both interior and exterior.
16. Architect shall coordinate equipment storage requirements.
17. Architect shall coordinate with DPS items that are to be fixed and/or moveable.
18. If a pool is involved, a pool consultant shall be hired and include associated equipment requirements for lanes, diving boards, starting blocks, etc. Reference NFHS Swimming Rules for construction standards.
19. All outdoor poles in paved areas shall be painted safety yellow, coordinate with Section 09 91 00.

20. No motorized rigid partitions shall be used to divide interior recreation space.
21. Architect shall coordinate the requirements for an electronic scoreboard with DPS.
22. Coordinate with DPS if indoor Basketball goals are fixed or foldable.
23. If shooting and archery ranges are to be part of the scope, a specialized consultant shall be required for the design of it.
24. The following materials are not permitted to be used on exterior play areas or equipment.
  - a. Wood.
  - b. Recycled Plastic.
  - c. Synthetic Lumber.
  - d. Concrete: Unless used for Structure.
  - e. Rubber Tires.
  - f. Non-commercial: 'Home made' equipment.

**END OF SECTION 00 91 00**