

Playground Safety Primer: Plan Review

Playground plan review authority

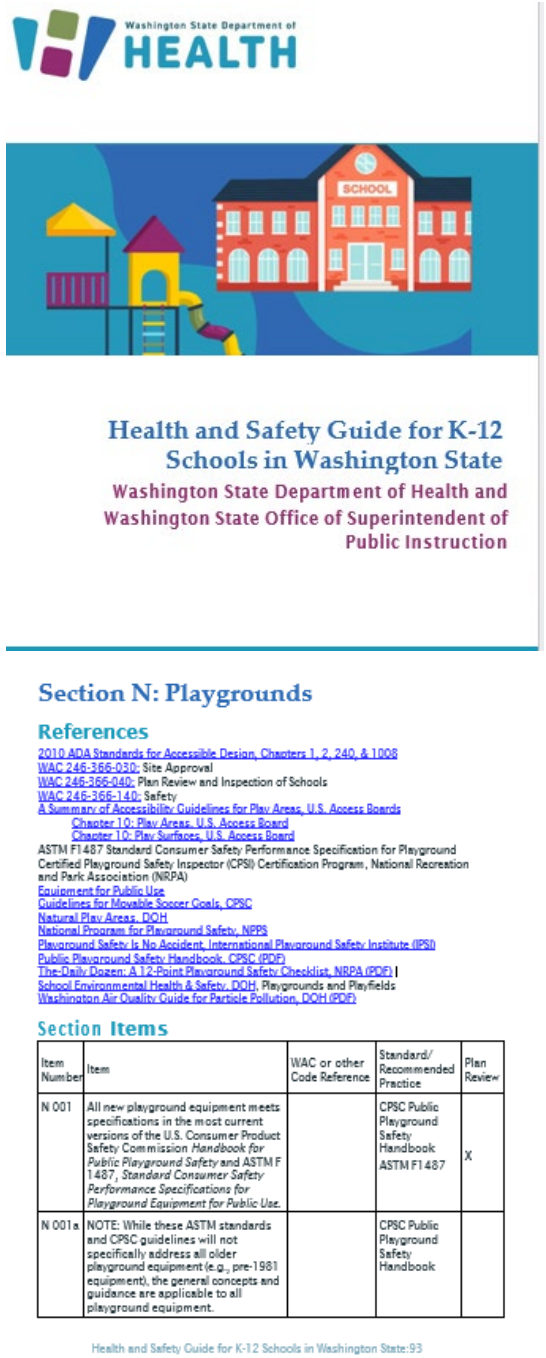
WAC 246-366

- LHJ Authority
- Plan review and inspection



DOH OSPI K-12 School Health & Safety Guide

- Section N- Playgrounds
- Standards and guidance: ASTMs; CPSC Handbook



Washington State Department of HEALTH

Health and Safety Guide for K-12 Schools in Washington State

Washington State Department of Health and Washington State Office of Superintendent of Public Instruction

Section N: Playgrounds

References

2010 ADA Standards for Accessible Design, Chapters 1, 2, 240, & 1008
WAC 246-366-030: Site Approval
WAC 246-366-040: Plan Review and Inspection of Schools
WAC 246-366-140: Safety
A Summary of Accessibility Guidelines for Play Areas, U.S. Access Boards
Chapter 10: Play Areas, U.S. Access Board
Chapter 10: Play Surfaces, U.S. Access Board
ASTM F1487 Standard Consumer Safety Performance Specification for Playground
Certified Playground Safety Inspector (CPSI) Certification Program, National Recreation and Park Association (NRPA)
Equipment for Public Use
Guidelines for Movable Soccer Goals, CPSC
Natural Play Areas, DOH
National Program for Playground Safety, NPPS
Playground Safety Is No Accident, International Playground Safety Institute (IPSI)
Public Playground Safety Handbook, CPSC (PDF)
The Daily Dozen: A 12-Point Playground Safety Checklist, NRPA (PDF) |
School Environmental Health & Safety, DOH, Playgrounds and Playfields
Washington Air Quality Guide for Particle Pollution, DOH (PDF)

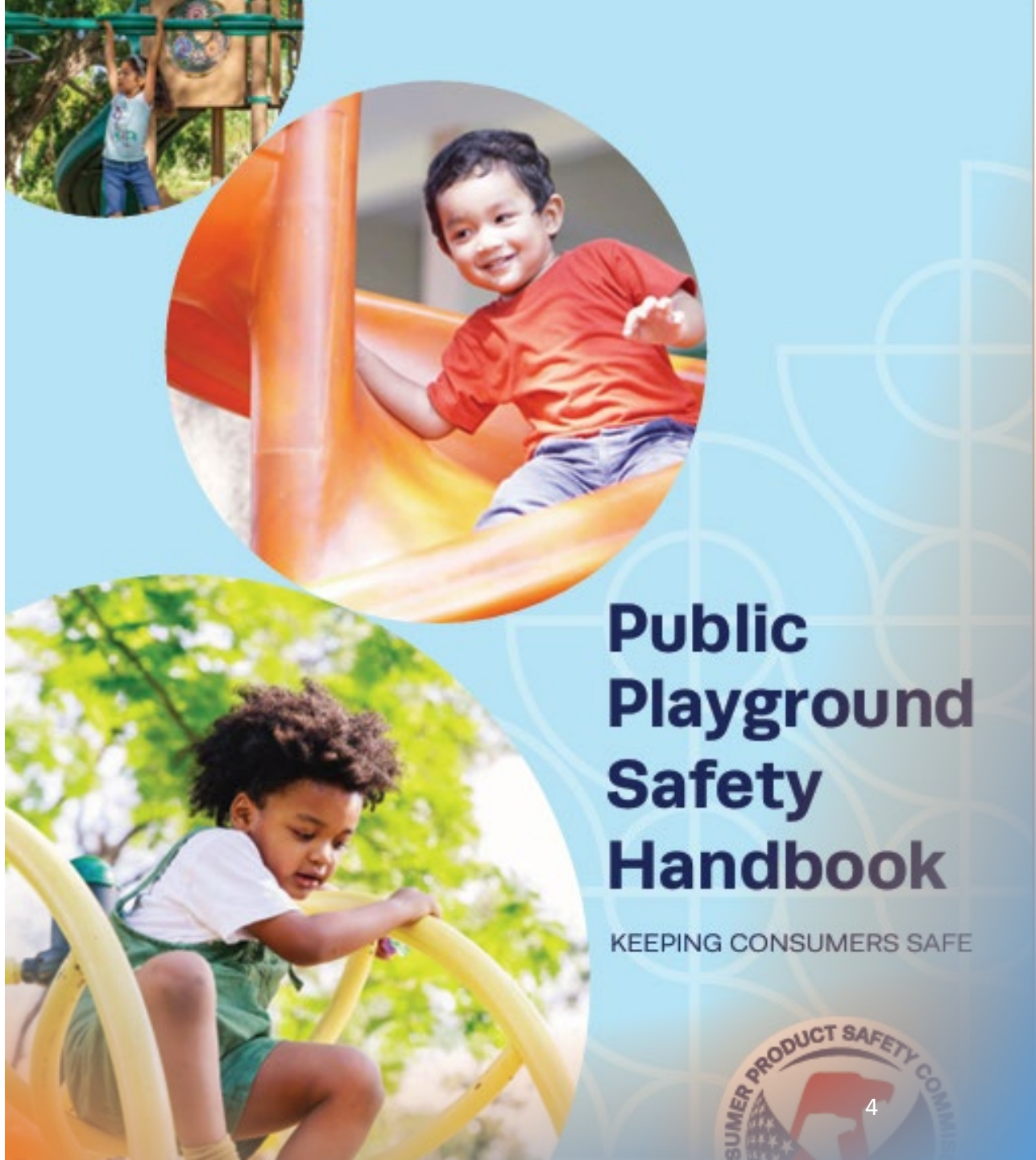
Section Items

Item Number	Item	WAC or other Code Reference	Standard/ Recommended Practice	Plan Review
N 001	All new playground equipment meets specifications in the most current versions of the U.S. Consumer Product Safety Commission *Handbook for Public Playground Safety* and ASTM F 1487, *Standard Consumer Safety Performance Specifications for Playground Equipment for Public Use.*		CPSC Public Playground Safety Handbook ASTM F1487	X
N 001a	NOTE: While these ASTM standards and CPSC guidelines will not specifically address all older playground equipment (e.g., pre-1981 equipment), the general concepts and guidance are applicable to all playground equipment.		CPSC Public Playground Safety Handbook	

Health and Safety Guide for K-12 Schools in Washington State:93

Standards and Guidelines

- CPSC *Public Playground Safety Handbook*
- Key ASTMs
  - Playground Equipment
  - Surfacing
- ADA Access

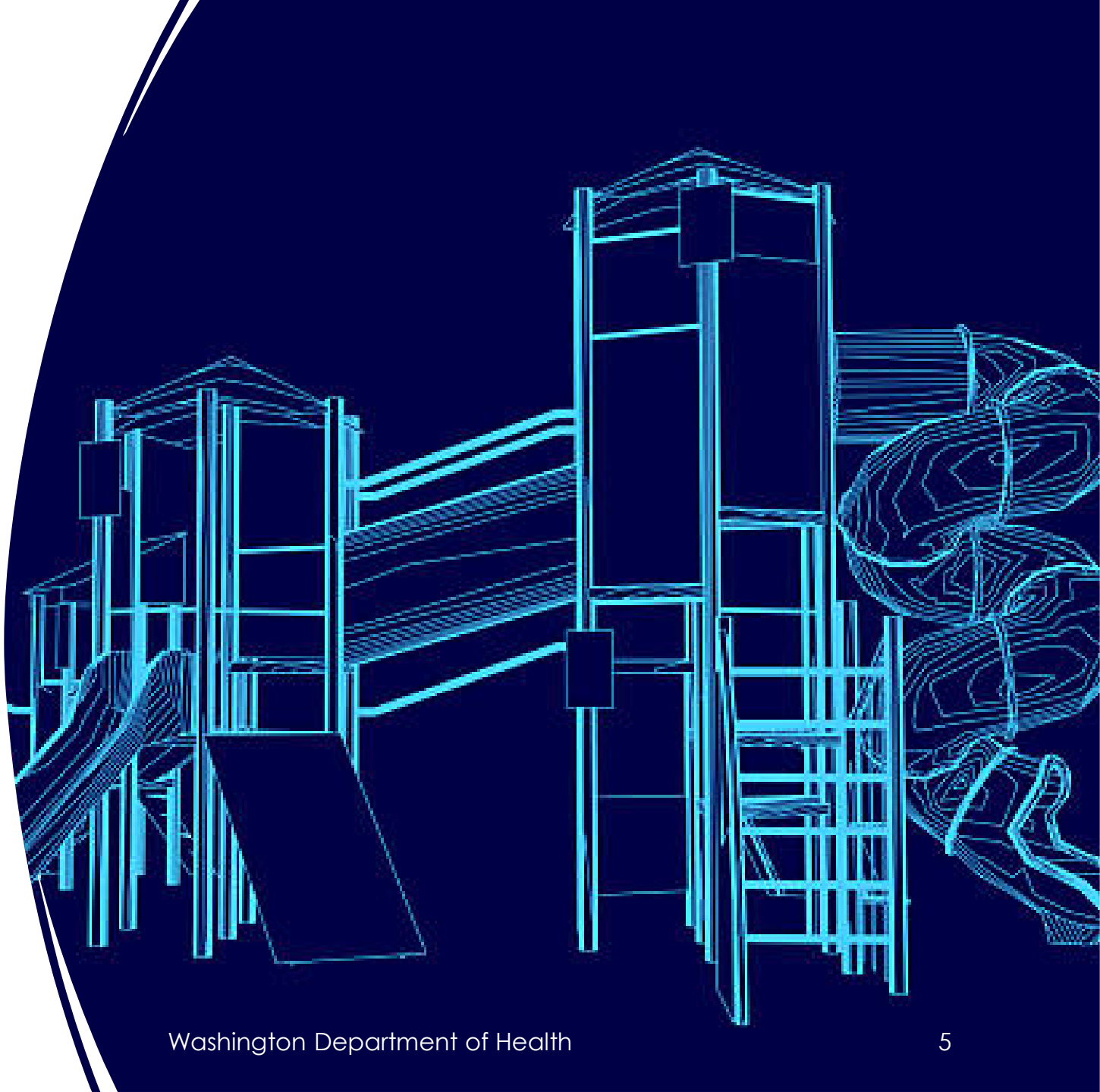


Recommended qualifications to review plans and inspect

Certified Playground Safety Inspector (CPSI) NRPA certification CPSI

Why get CPSI?

- Follows CPSC Handbook and ASTM standards
- CPSI Connect, online discussion board



Recommended Options for plan review

- Trained LHJ staff
  - CPSI
  - Agreement with another county
  - Request assistance from DOH



Playground Plan Review Checklist DOH

- LHJ staff not available
  - DOH agreement with LHJ
  - DOH performs plan review, provides recommendations to LHJ
  - LHJ provides approval, send to school with copy to DOH



Agreement with LHJ

Formal application:

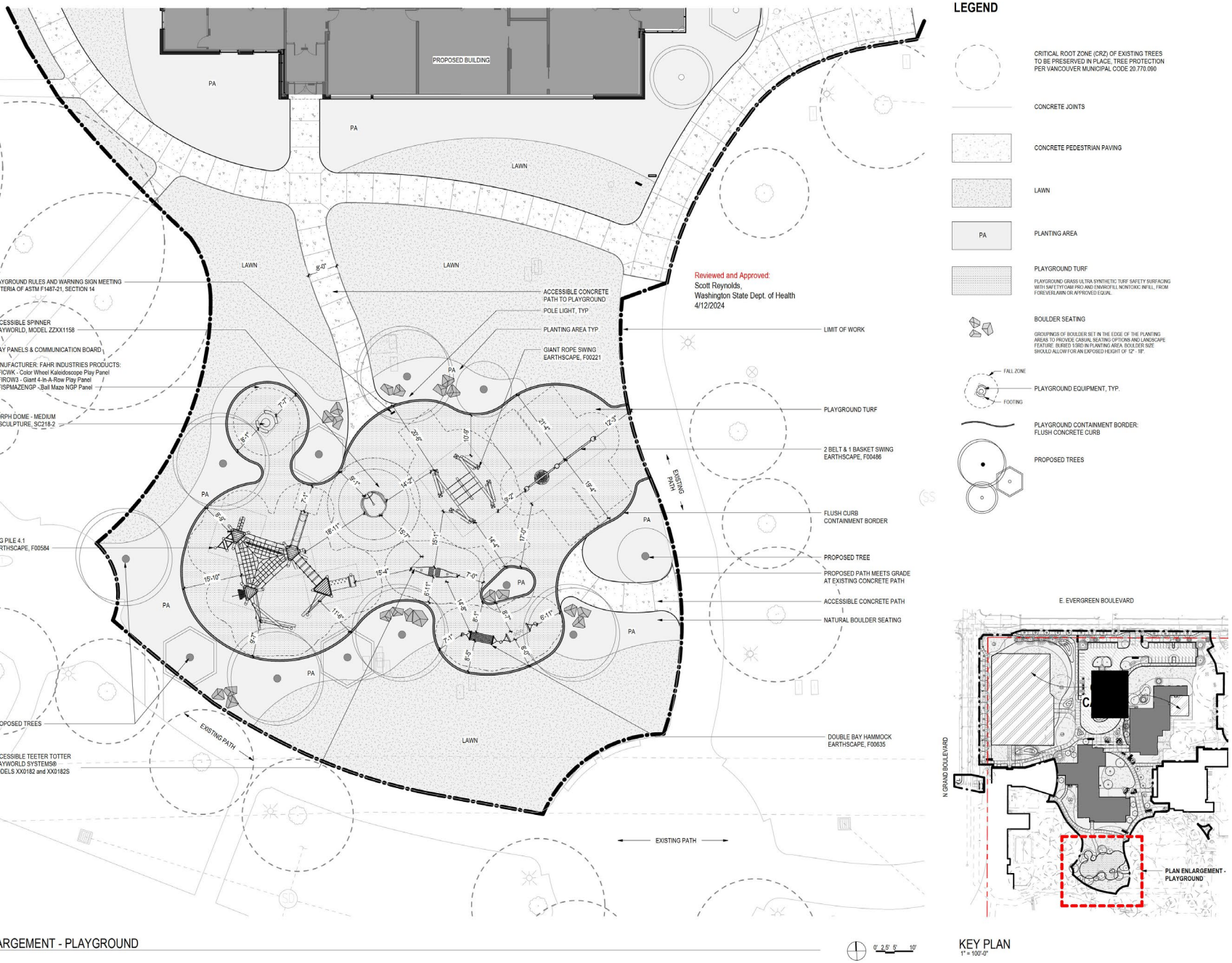
Install, replace, repair or move play equipment or surfacing

Plan Review Application

Project Type	Playground Project	
Grade Level		
Site Information	School Name:	
	School Address:	
	School District:	
Septic/Sewer System	Type of waste system: ☐ Septic ☐ Sewer	
Water System	Type of water system: ☐ Public ☐ Private well ☐ Other Name of water purveyor:	
Design Professional Contact Information	Design Professional:	
	Company:	
	Company Address:	
	Office Phone:	Cell Phone:
	Email:	
Primary Contact Information	School Project Manager:	
	Address:	
	Office Phone:	Cell Phone:
	Email:	
Billing Information	Person to receive billing/invoices:	
	Mailing Address:	
	Office Phone:	Cell Phone:
	Email:	

Specify information required for approval:

- Site
- Surfacing
- Equipment
- Layout
- Accessible route
- Terms of approval:
  - Install per approval plans
  - Pre-approval of any changes
  - Pre-opening inspection



ARGEMENT - PLAYGROUND

KEY PLAN
1" = 100'-0"

Are these plans OK?

- Drawn to scale
- Top-down layout view
- Containment border
- Access route
- Dimensions
- Equipment
- Surfacing type
- Fall height
- Site:
  - Directional North arrow
  - Shows how plans conform to site

Plan Review Approval Letter

- Pre-operational inspection
- Changes to approved plans require approval by LHJ
- Playground installer must follow approved plans
- Installed only by qualified person
- Installer has copy of approved plans at inspection

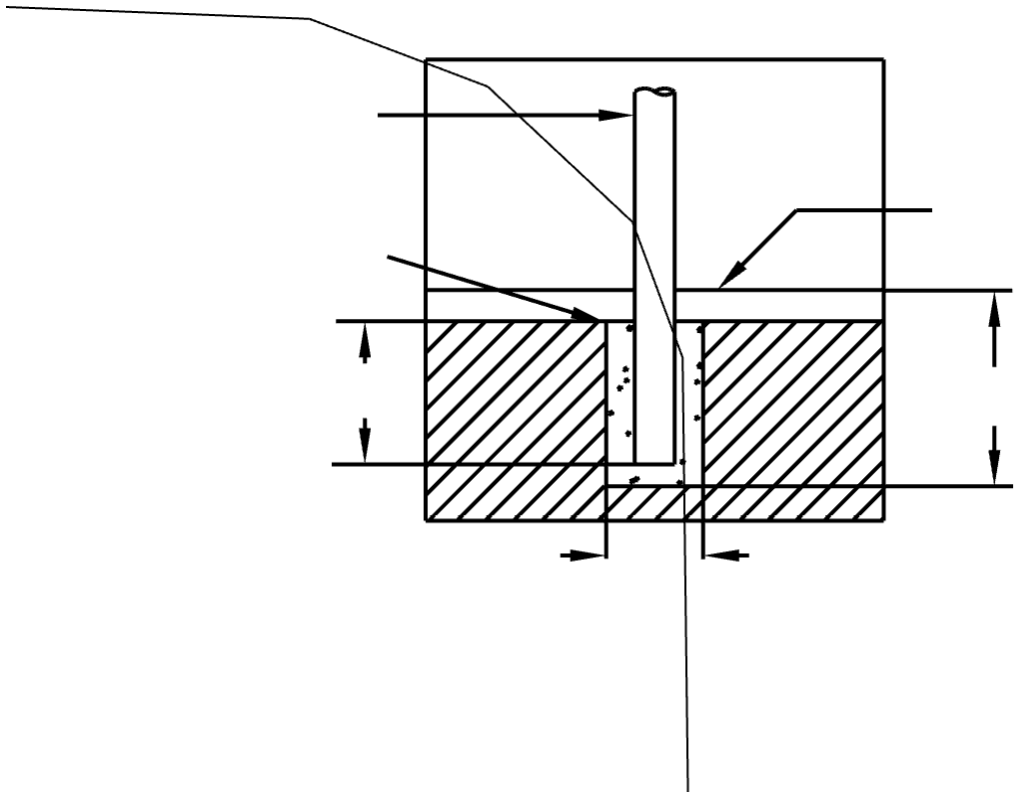




Are these plans OK?

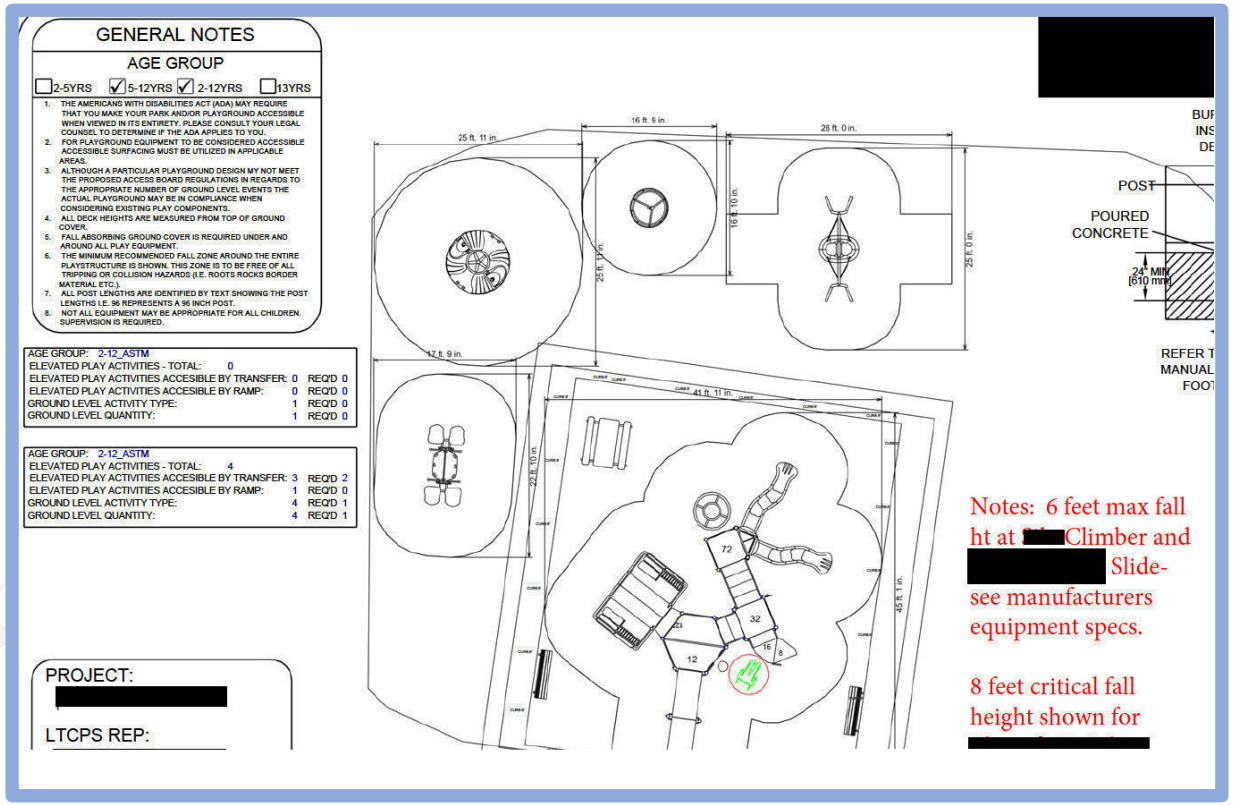
Show any cross-sectional views to confirm:

- Essential equipment dimensions
- Anchoring
- Fall height



Are these plans OK?

- Use zones
- Fall height
  - Play equipment
  - Platforms



Are these plans ok?

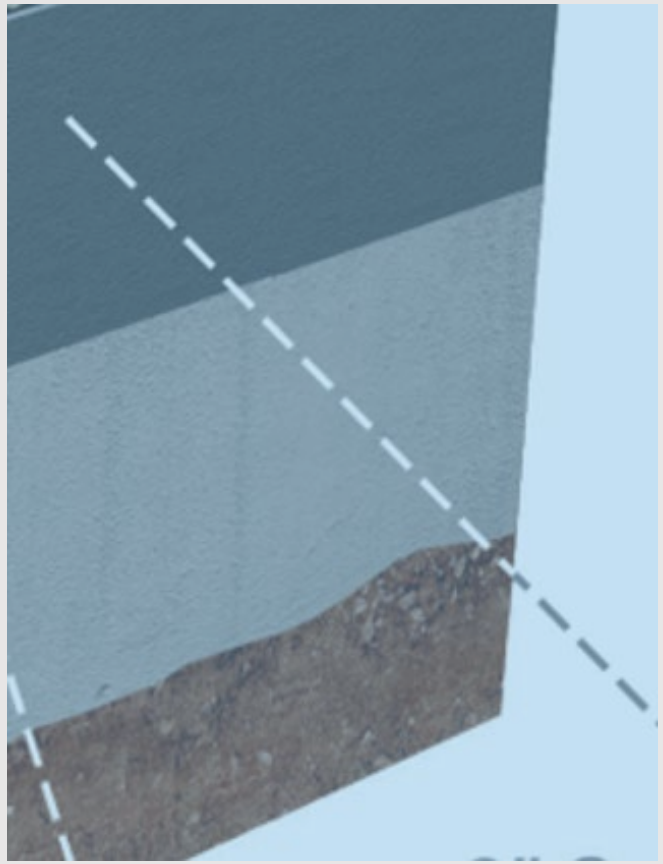
Product statement example:

Available in various thicknesses:

1”, 1.5”, 2”, and 3”

Fall height protection ranges from 3’ to 10’.

The 3” foam layer protects up to a 10’ fall.



3” protective foam

Is it Engineered Wood Fiber?

- ASTM F2075 - Standard Specification for Engineered Wood Fiber for Use as a Playground Safety Surface…
- Confirm on plans
- Verify at inspection



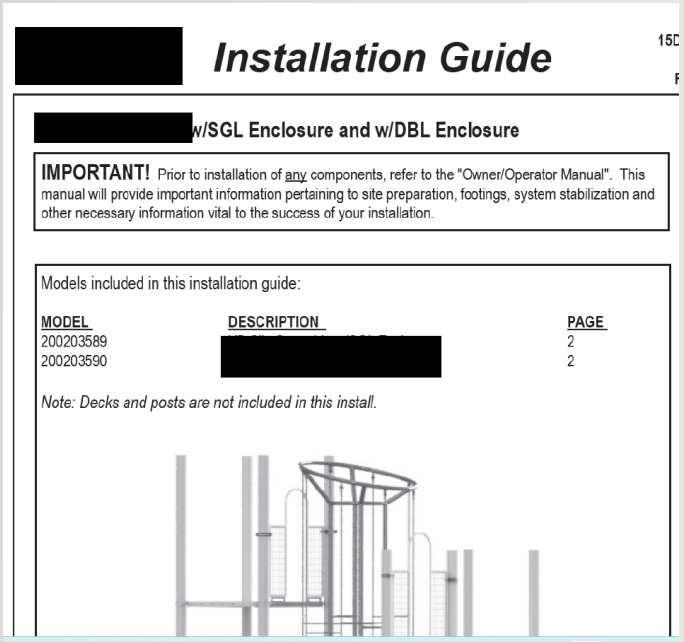


Are these plans ok?



Some plan information may be for general illustration.

Confirm items such as hand grips on equipment specs and installation drawings.



[redacted] **Installation Guide**

15D

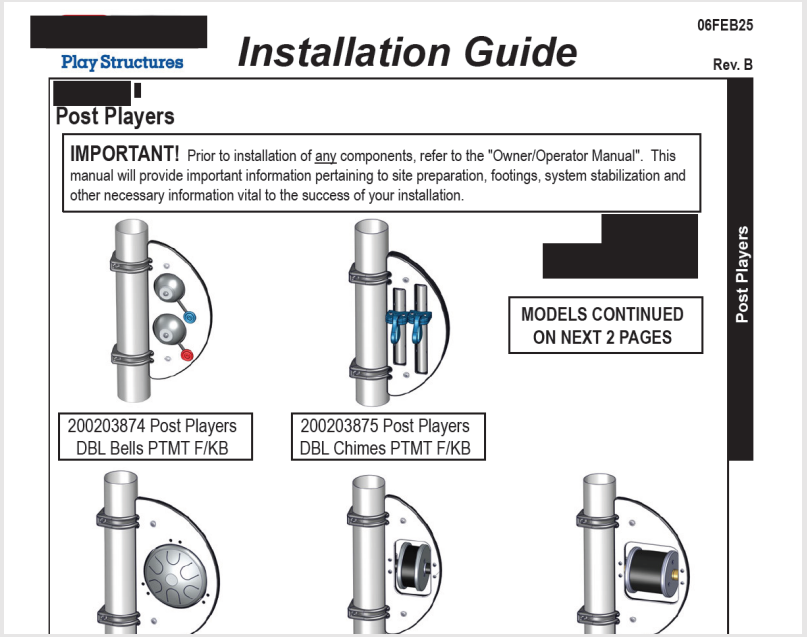
[redacted] w/SGL Enclosure and w/DBL Enclosure

IMPORTANT! Prior to installation of any components, refer to the "Owner/Operator Manual". This manual will provide important information pertaining to site preparation, footings, system stabilization and other necessary information vital to the success of your installation.

Models included in this installation guide:

MODEL	DESCRIPTION	PAGE
200203589	[redacted]	2
200203590		2

Note: Decks and posts are not included in this install.



[redacted] Play Structures **Installation Guide**

06FEB25

Rev. B

[redacted] Post Players

IMPORTANT! Prior to installation of any components, refer to the "Owner/Operator Manual". This manual will provide important information pertaining to site preparation, footings, system stabilization and other necessary information vital to the success of your installation.

[redacted]

MODELS CONTINUED ON NEXT 2 PAGES

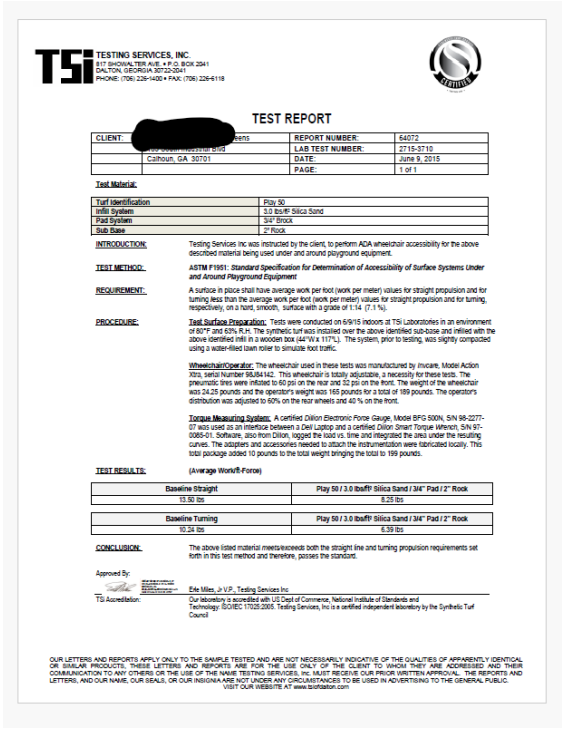
Post Players

200203874 Post Players DBL Bells PTMT F/KB

200203875 Post Players DBL Chimes PTMT F/KB

Test results

- Metals- Lead
- Surface impact
- Wheelchair access
- Critical fall height



TSI TESTING SERVICES, INC.
817 SHOAL TER AVE • P.O. BOX 2041
DALTON, GEORGIA 30722-2041
PHONE: (706) 226-1400 • FAX: (706) 226-6118

TEST REPORT

CLIENT: [redacted]		REPORT NUMBER:	64072
		LAB TEST NUMBER:	2715-3710
	Calhoun, GA 30701	DATE:	June 9, 2015
		PAGE:	1 of 1

Test Material:

Turf Identification	Play 50
Infill System	3.0 lbs/ft² Silica Sand
Pad System	3/4" Brock
Sub Base	2" Rock

INTRODUCTION: Testing Services Inc was instructed by the client, to perform ADA wheelchair accessibility for the above described material being used under and around playground equipment.

TEST METHOD: ASTM F1951: *Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment*

REQUIREMENT: A surface in place shall have average work per foot (work per meter) values for straight propulsion and for turning less than the average work per foot (work per meter) values for straight propulsion and for turning, respectively, on a hard, smooth, surface with a grade of 1:14 (7.1 %).

PROCEDURE: Test Surface Preparation: Tests were conducted on 6/9/15 indoors at TSI Laboratories in an environment of 80°F and 63% R.H. The synthetic turf was installed over the above identified sub-base and infilled with the above identified infill in a wooden box (44"W x 117"L). The system, prior to testing, was slightly compacted using a water-filled lawn roller to simulate foot traffic.

Wheelchair/Operator: The wheelchair used in these tests was manufactured by Invacare, Model Action Xtra, serial Number 9BJ84142. This wheelchair is totally adjustable, a necessity for these tests. The pneumatic tires were inflated to 60 psi on the rear and 32 psi on the front. The weight of the wheelchair was 24.25 pounds and the operator's weight was 165 pounds for a total of 189 pounds. The operators distribution was adjusted to 60% on the rear wheels and 40 % on the front.

Torque Measuring System: A certified *Dillon Electronic Force Gauge*, Model BFG 500N, S/N 98-2277-07 was used as an interface between a Dell Laptop and a certified *Dillon Smart Torque Wrench*, S/N 97-0065-01. Software, also from Dillon, logged the load vs. time and integrated the area under the resulting curves. The adapters and accessories needed to attach the instrumentation were fabricated locally. This total package added 10 pounds to the total weight bringing the total to 199 pounds.

TEST RESULTS: (Average Work/ft-Force)

Baseline Straight	Play 50 / 3.0 lbs/ft² Silica Sand / 3/4" Pad / 2" Rock
15.50 lbs	8.25 lbs

Baseline Turning	Play 50 / 3.0 lbs/ft² Silica Sand / 3/4" Pad / 2" Rock
10.24 lbs	6.39 lbs

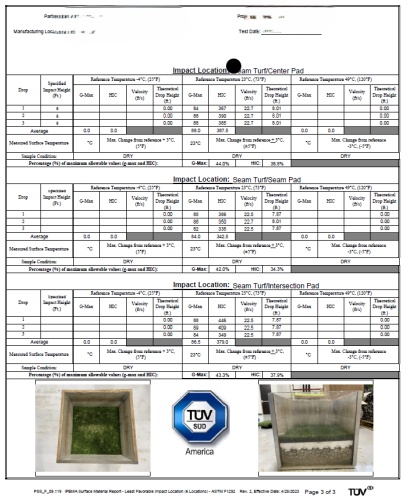
CONCLUSION: The above listed material meets/exceeds both the straight line and turning propulsion requirements set forth in this test method and therefore, passes the standard.

Approved By:

Eric Miles, Jr V.P., Testing Services Inc

TSI Accreditation: Our laboratory is accredited with LSI Dept of Commerce, National Institute of Standards and Technology, ISO/IEC 17025:2005. Testing Services, Inc is a certified independent laboratory by the Synthetic Turf Council

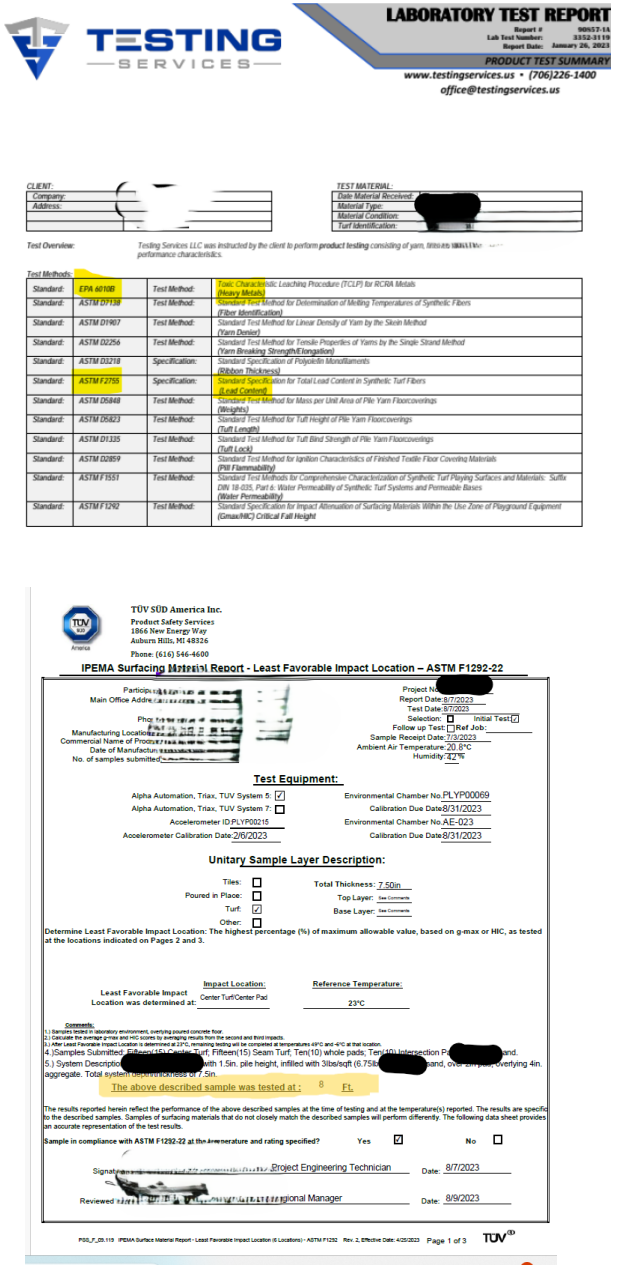
OUR LETTERS AND REPORTS APPLY ONLY TO THE SAMPLE TESTED AND ARE NOT NECESSARILY INDICATIVE OF THE QUALITIES OF APPARENTLY IDENTICAL OR SIMILAR PRODUCTS. THESE LETTERS AND REPORTS ARE FOR THE USE ONLY OF THE CLIENT TO WHOM THEY ARE ADDRESSED AND THEIR COMMUNICATION TO ANY OTHERS OR THE USE OF THE NAME TESTING SERVICES, INC. MUST RECEIVE OUR PRIOR WRITTEN APPROVAL. THE REPORTS AND LETTERS, AND OUR NAME, OUR SEALS, OR OUR INSIGNIA ARE NOT UNDER ANY CIRCUMSTANCES TO BE USED IN ADVERTISING TO THE GENERAL PUBLIC. VISIT OUR WEBSITE AT www.tsifabtalon.com



Impact Location: Seam Turf/Center Pad

Impact Location: Seam Turf/Seam Pad

Impact Location: Seam Turf/Intersection Pad



TESTING SERVICES

LABORATORY TEST REPORT

PRODUCT TEST SUMMARY

www.testingservices.us • (706)226-1400
office@testingservices.us

CLIENT:
Company: [redacted]
Address:

TEST MATERIAL:
Date Material Received:
Material Type:
Material Condition:
Turf Identification:

Test Overview: Testing Services LLC was instructed by the client to perform **product testing** consisting of yarn, tri-lobal [redacted] performance characteristics.

Test Methods:

Standard:	EPA 6010B	Test Method:	Toxic Characteristic Leaching Procedure (TCLP) for RCRA Metals (Heavy Metals)
Standard:	ASTM D7138	Test Method:	Standard Test Method for Determination of Melting Temperatures of Synthetic Fibers (Fiber Identification)
Standard:	ASTM D1907	Test Method:	Standard Test Method for Linear Density of Yarn by the Skein Method (Yarn Denier)
Standard:	ASTM D2256	Test Method:	Standard Test Method for Tensile Properties of Yarns by the Single Strand Method (Yarn Breaking Strength/Elongation)
Standard:	ASTM D3218	Specification:	Standard Specification of Polyolefin Monofilaments (Ribbon Thickness)
Standard:	ASTM F2755	Specification:	Standard Specification for Total Lead Content in Synthetic Turf Fibers (Lead Content)
Standard:	ASTM D5848	Test Method:	Standard Test Method for Mass per Unit Area of Pile Yarn Floorcoverings (Weights)
Standard:	ASTM D5823	Test Method:	Standard Test Method for Tuft Height of Pile Yarn Floorcoverings (Tuft Length)
Standard:	ASTM D1335	Test Method:	Standard Test Method for Tuft Bind Strength of Pile Yarn Floorcoverings (Tuft Lock)
Standard:	ASTM D2859	Test Method:	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials (Pill Flammability)
Standard:	ASTM F1551	Test Method:	Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials: Suffix DIN 18-035, Part 6: Water Permeability of Synthetic Turf Systems and Permeable Bases (Water Permeability)
Standard:	ASTM F1292	Test Method:	Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment (Gmax/HIC) Critical Fall Height

TÜV SÜD America Inc.
Product Safety Services
1866 New Energy Way
Auburn Hills, MI 48326
Phone: (616) 546-4600

IPEMA Surfacing Material Report - Least Favorable Impact Location – ASTM F1292-22

Participa[redacted]
Main Office Addre[redacted]
Phon[redacted]
Manufacturing Locatio[redacted]
Commercial Name of Produc[redacted]
Date of Manufactur[redacted]
No. of samples submitte[redacted]

Project N[redacted]
Report Date: 8/7/2023
Test Date: 8/7/2023
Selection: ☐ Initial Test ☑
Follow up Test: ☐ Ref Job:
Sample Receipt Date: 7/3/2023
Ambient Air Temperature: 20.8°C
Humidity: 42%

Test Equipment:

Alpha Automation, Triax, TUV System 5: ☑
Alpha Automation, Triax, TUV System 7: ☐
Accelerometer ID: PLYP00215
Accelerometer Calibration Date: 2/6/2023
Environmental Chamber No.: PLYP00069
Calibration Due Date: 8/31/2023
Environmental Chamber No.: AE-023
Calibration Due Date: 8/31/2023

Unitary Sample Layer Description:

Tiles: ☐
Poured in Place: ☐
Turf: ☑
Other: ☐
Total Thickness: 7.50in
Top Layer: See Comments
Base Layer: See Comments

Determine Least Favorable Impact Location: The highest percentage (%) of maximum allowable value, based on g-max or HIC, as tested at the locations indicated on Pages 2 and 3.

Least Favorable Impact Location was determined at: Impact Location: Center Turf/Center Pad
Reference Temperature: 23°C

Comments:
1.) Samples tested in laboratory environment, overlying poured concrete floor
2.) Calculate the average g-max and HIC scores by averaging results from the second and third impacts.
3.) After Least Favorable Impact Location is determined at 23°C, remaining testing will be completed at temperatures 49°C and -6°C at that location.
4.) (Samples Submitted: [redacted] Turf, Fifteen(15) Seam Turf, Ten(10) whole pads, Ten(10) Intersection P[redacted] and.
5.) System Description: [redacted] with 1.5in. pile height, infilled with 3lbs/sqft (6.75lb[redacted] and, over [redacted] overlying 4in. aggregate. Total system [redacted] ness of 7.5in.

The above described sample was tested at : [redacted] Ft.

The results reported herein reflect the performance of the above described samples at the time of testing and at the temperature(s) reported. The results are specific to the described samples. Samples of surfacing materials that do not closely match the described samples will perform differently. The following data sheet provides an accurate representation of the test results.

Sample in compliance with ASTM F1292-22 at the temperature and rating specified? Yes ☑ No ☐

Signature: [redacted] Project Engineering Technician Date: 8/7/2023

Reviewed [redacted] gional Manager Date: 8/9/2023

FDS_F_03.119 IPEMA Surface Material Report - Least Favorable Impact Location (6 Locations) - ASTM F1292 Rev. 2, Effective Date: 4/25/2023 Page 1 of 3

What about ADA?

[ADA 2010 DOJ Design Standards]

CPSC Playground Safety Handbook: designers aware to meet ADA standards

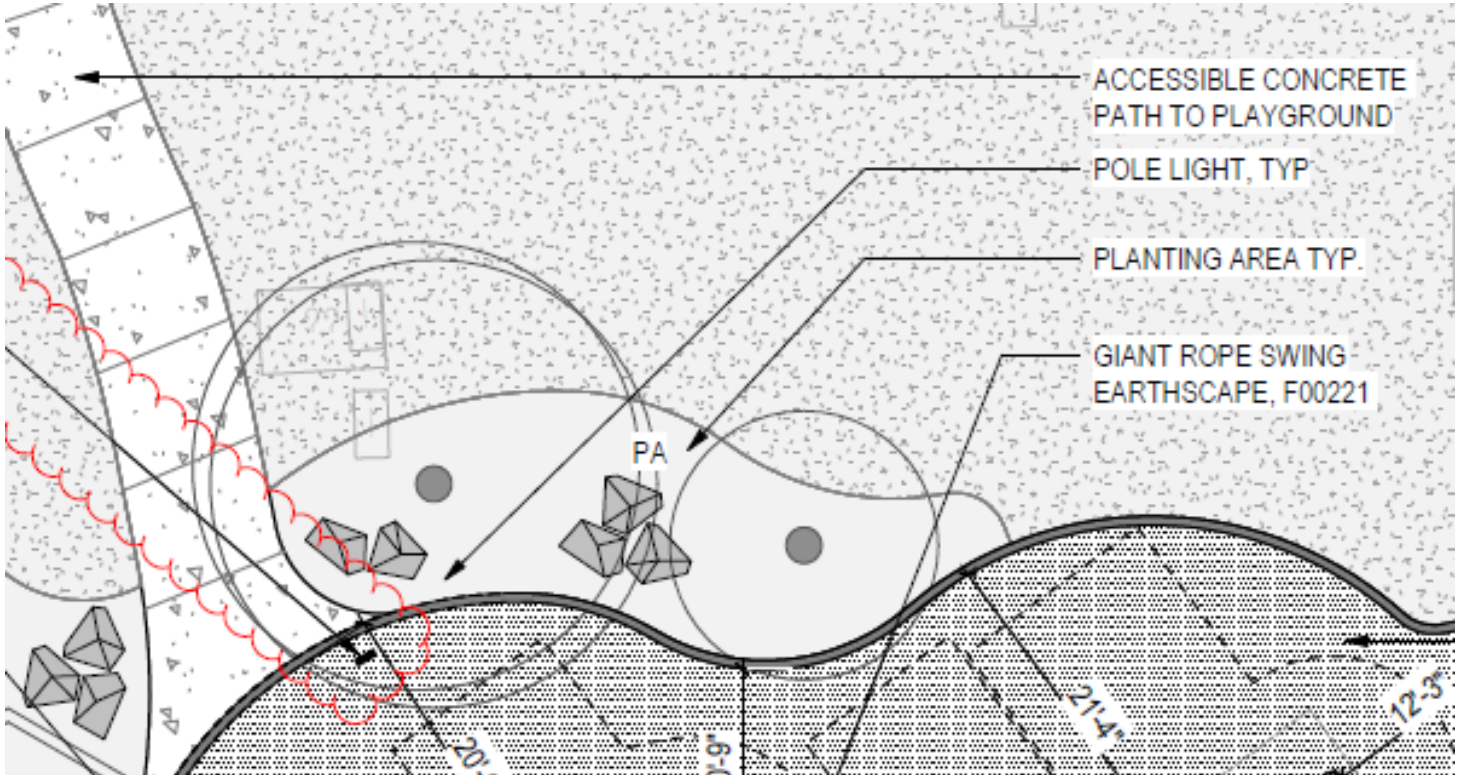
[DOH Guidance- Playground ADA Compliance]

- Accessible route to enter and exit
- Accessible route to equipment
- At least one accessible connection to each type of play component
- Ground surfaces ASTM F1951
- Use zone ASTM F1292



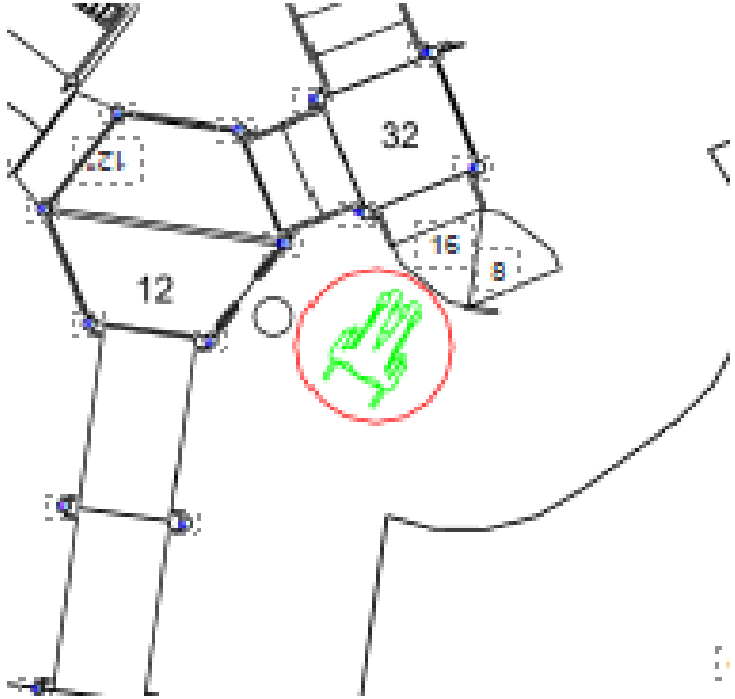
What about ADA?

Show ADA accessible route to equipment



Plans and ADA

The above layout:	
✓	COMPLIES TO ASTM
✓	COMPLIES TO CPSC
✓	COMPLIES TO ADA



ADA SCHEDULE	Total Elevated Play Activities: 8		
	Total Ground-Level Play Activities: 13		
	Accessible Elevated Activities	Accessible Ground-Level Activities	Accessible Ground-Level Play Types
Required	4	3	3
Provided	4	13	5

✓ ASTM F1487-21
✓ CPSC #325

✓ THIS PLAYGROUND DESIGN MEETS THE FINAL ACCESS BOARD REGULATION.

Is this site OK?

Plans show fences, trees, structures, septic system, drainfields, wells or protective covenants or easements

Slope and drainage:

“Ensure a drainage system is adequate for the removal of water in a timely manner”- CPSC Handbook









Site concerns

- Approval to install playground at this location?
- Designer confirm with LHJ and local building authority

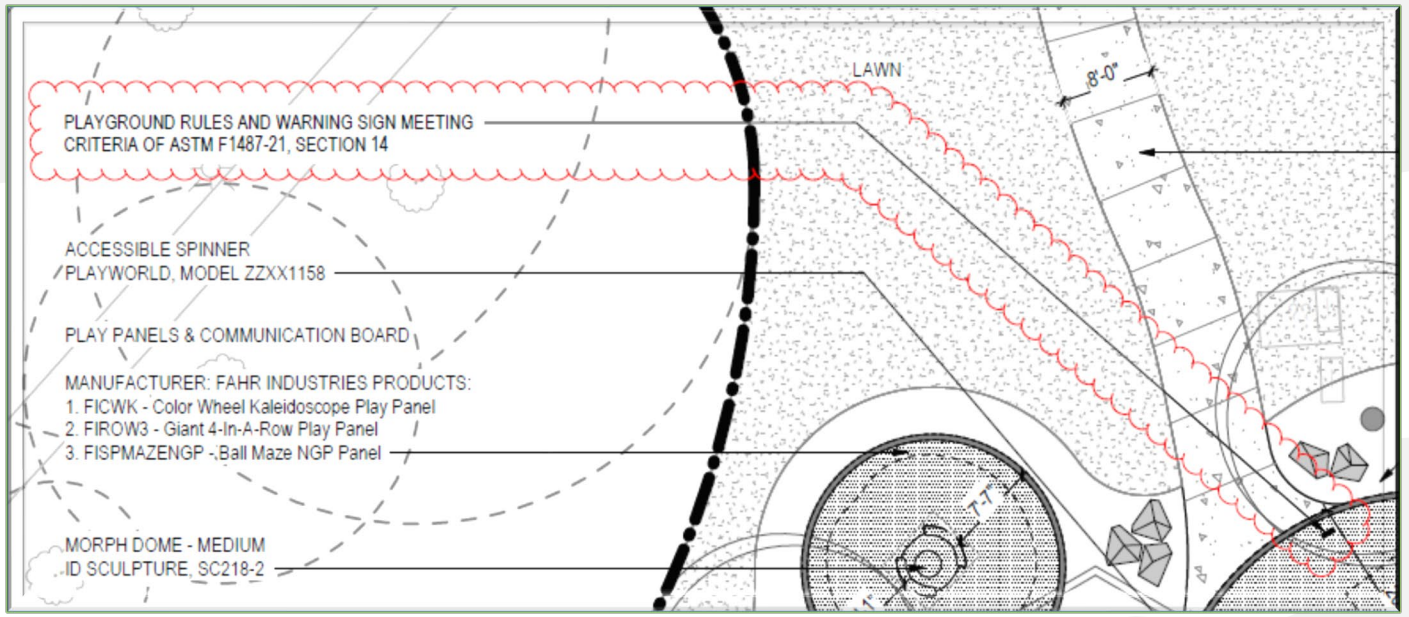
Construction permits needed?

- Verify meets standards for clearances from play surfaces, use zones, and equipment
- Local building authority may review as structure
- DOH Playground Safety in Warm Weather



Condition of plan approval

Designer includes picture or statement of warning sign to be posted and meet criteria of ASTM F1487, sec. 14





Examples of conditions of approval

- May appear as plan notes
- Shows requirement for installer

NOTE:

1. AFTER PLAYGROUND INSTALLATION AND PRIOR TO ITS FIRST USE, OWNER MUST OBTAIN WRITTEN VERIFICATION FROM A QUALIFIED PERSON THAT EQUIPMENT AND IMPACT ATTENUATING SURFACING HAVE BEEN INSTALLED PER REQUIREMENTS OF APPROPRIATE STANDARD SPECIFICATION AND ACCESSIBILITY.

2. AFTER PLAYGROUND INSTALLATION, AND PRIOR TO ITS FIRST USE, PLAYGROUND EQUIPMENT AND IMPACT ATTENUATING SURFACING INSTALLER MUST PROVIDE THE OWNER WITH WRITTEN VERIFICATION FROM A QUALIFIED PERSON THAT THEY WERE INSTALLED PER DESIGNER/MANUFACTURER SPECIFICATIONS, AND ACCORDING TO OWNER'S APPROVED PLANS AND PURCHASING REQUIREMENTS.

Plan notes and surfacing

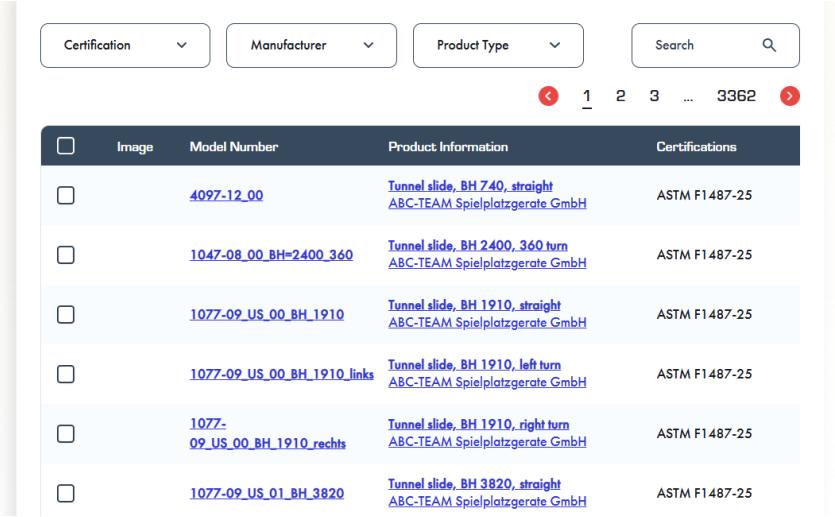
- “Surfacing for this design meets ASTM F1292 requirements for X’ critical fall height of the equipment.”
- “Both the playground equipment and the surfacing are IPEMA certified.”
- “All installation work will be performed by a CPSI certified installation team and according to the CPSC standards.”
- “If installing generic type, loose-fill surfacing … testing in accordance with ASTM F1292 and/or F3313 (field test) is recommended.”

CONDITION OF PLAN APPROVAL:

3RD-PARTY CERTIFICATION

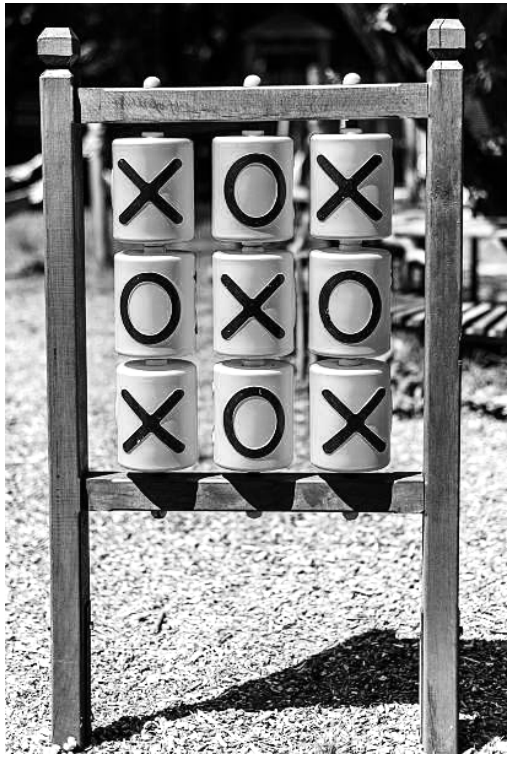
The International Play Equipment Manufacturers Association- IPEMA

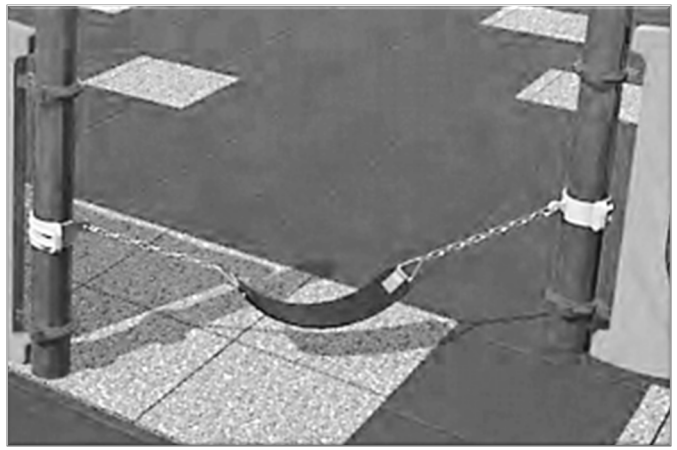
Provides third-party certification of conformance to certain ASTM standards.



INTERNATIONAL PLAY EQUIPMENT MANUFACTURERS ASSOCIATION
PUBLIC PLAY EQUIPMENT
IPEMA CERTIFIED TO ASTM F1487
To verify product certification, visit www.ipema.org

THE PLAY COMPONENTS IDENTIFIED IN THIS PLAN ARE IPEMA CERTIFIED. THE USE AND LAYOUT OF THE COMPONENTS CONFORM TO THE REQUIREMENTS OF ASTM F1487.





Does the equipment need a use zone?

ASTM… equipment intended for user to maintain contact with the ground has no use zone requirement

Questions to ask:

- How is equipment classified in ASTM?
- Is there a designated play area above ground? Yes, designed for sitting and with motion.
- In writing from a manufacturer supporting claim that product does not require a use zone?
- IPEMA certification?

What can go wrong?

Part Number	Description of fastener	QTY
5555555	Washer Flat 1.6MM	10
6666666	Screw machine type button head 1.5 X 70mm	10
777777	Barrel Nut 32mm	10

Manufacturer's specifications must match installed parts





Is this slope ok?

- Slope and Use Zone
- Level per surface manufacture
- Level per ADA
- Slope and erosion
- Slope and drainage
- Site required level by LHJ policy



Plans and installation concerns

- Maintain use zone
  - Site level

- Safe border
  - Landscape wall
  - Local building authority
  - Retention wall





Installation concerns

- Owner may incur further expenses
- Possible redesign, removal, or relocation of equipment
- Delay in approval to use playground

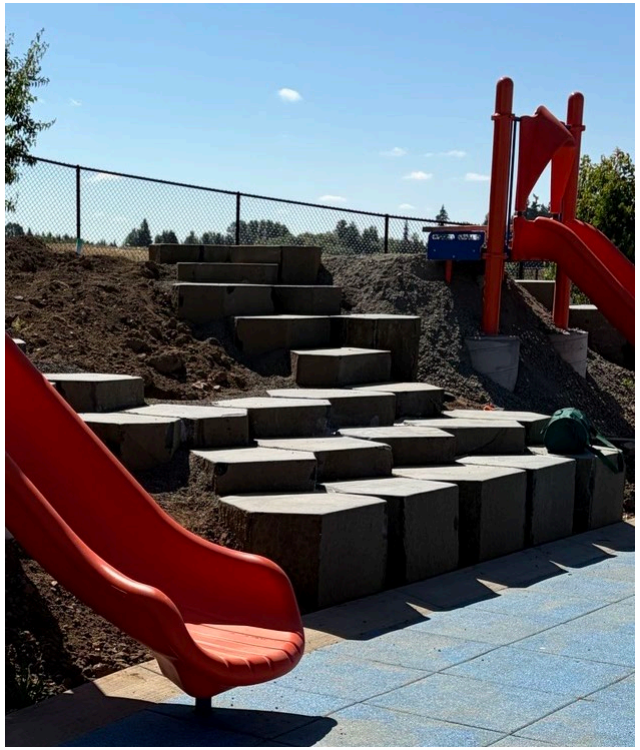


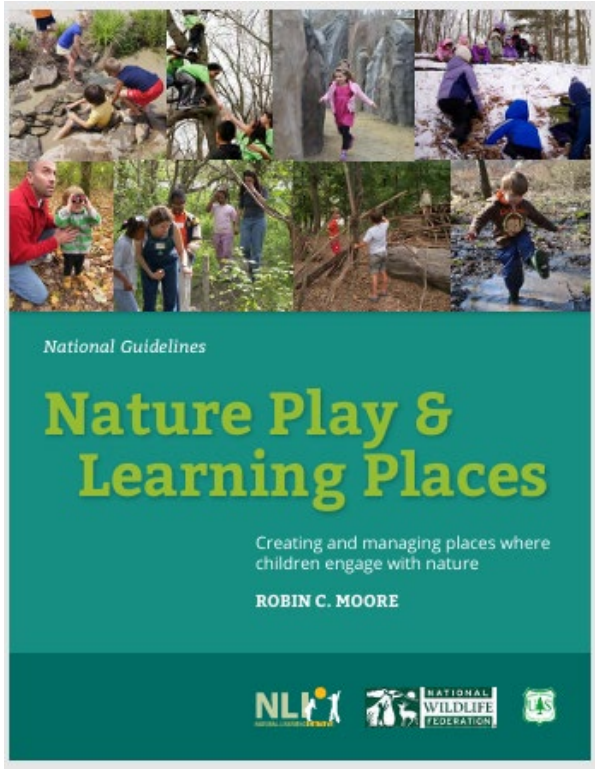
Natural play materials

[Natural Play Areas | Washington State Department of Health]

Meet equivalent to [CPSC Public Playground Handbook] or [ASTM]:

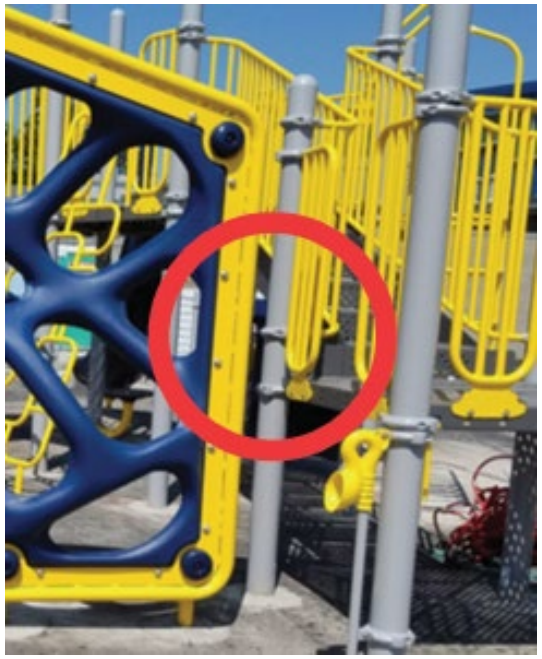
- Fall height
- Surfacing
- Barriers/guardrails
- Materials
- Appropriate spacing

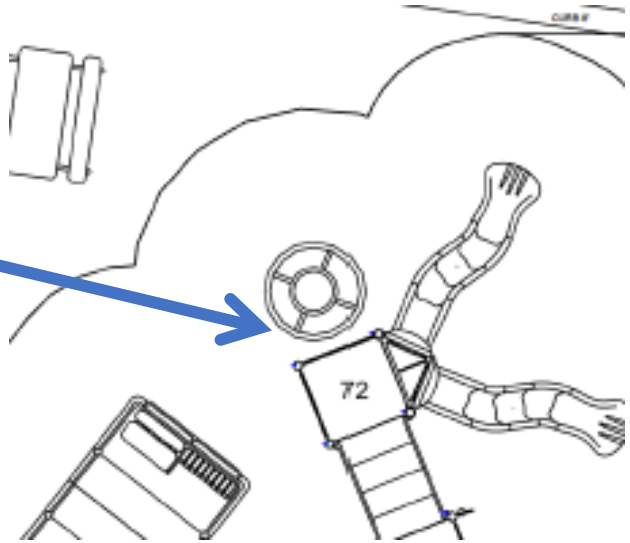




Functionally linked

- Avoid functionally linking climbing components intended to be stand-alone features.
- Example: This is not functionally linked. Per manufacturer “may be free standing or linked…”
- Guidance for functionally linked playground components





Testing surfacing in field after installation:

Condition of plan approval

Per manufacturer

- Protection for G-max and HIC (Head Injury Criterion) per ASTM Standards, and CPSC Handbook for Playground Safety
- Drop test: Ball representing head of a child dropped from highest designated play surface onto ground surface. GMAX levels must be below 200 G and HIC levels must be below 1000.

Prior to opening

- Satisfactory inspection and written report from LHJ
- Installer provides owner written verification, installed per designer, manufacturer specifications, approved plans



ASTM F1487 Section 11

- **Designer Responsibilities:**

  Provides clear and concise instructions for the installation

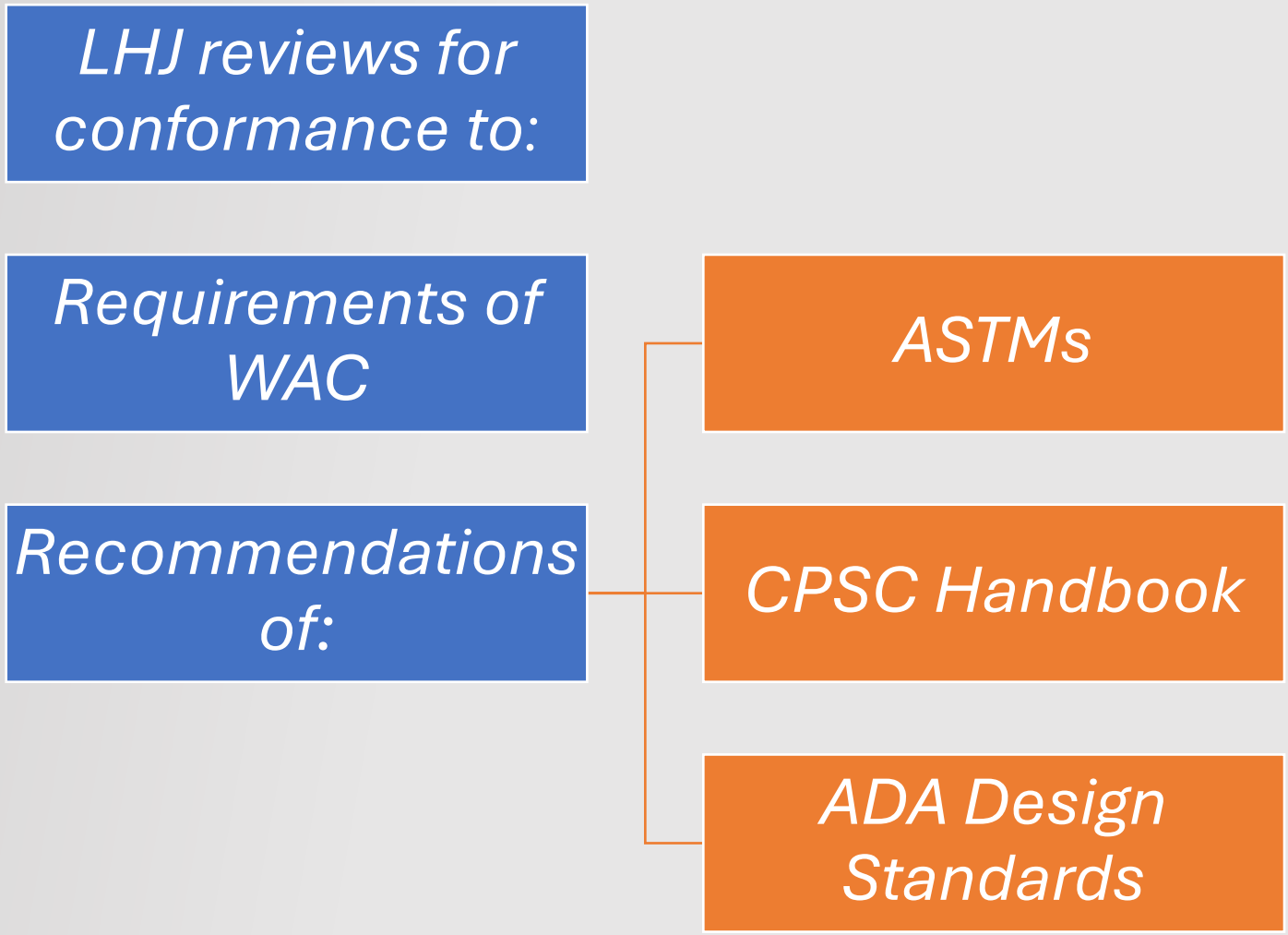
- **Owner Responsibilities:**

  Obtains written verification from qualified person that play equipment and impact attenuating surfacing have been installed meeting accessibility requirements

- **Installer Responsibilities:**

  Provides owner with written verification installed per designer/manufacturer specification and owner's approved plans

Reviewer's responsibilities:





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