Playground Construction Requirements:

PLAYGROUND GUIDELINE FOR: CONTRACTORS, ADMINISTRATORS DAYCARES & PARENT COUNCIL

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Pembina Trails School Division
Accomplish Anything

TABLE OF CONTENTS

PLAYGROUND CONSTRUCTION REQUIREMENTS

SCOPE:

This guideline establishes the Pembina Trails school division requirements for the installation of playground equipment on school division property. This handbook is expected to promote greater safety awareness and set standards for contractors, administrators and parent councils that purchase, install, and maintain playground equipment.

Because many factors may affect playground safety, this guideline, as well as the CSA standard Z614 Children's Playspaces and Equipment will be considered the mandatory requirements for playground installations.

This guideline applies to administrators, parent councils, contractors, etc. that purchase or install any type of playground equipment, outdoor exercise equipment or natural play spaces.

GENERAL:

A playground should allow children to develop gradually and test their skills by providing a series of graduated challenges. The challenges presented should be appropriate for age related abilities and should be ones that children can perceive and choose to undertake.

Toddlers, preschool- and school-age children differ dramatically, not only in physical size and ability, but also in their intellectual and social skills. Therefore, age-appropriate playground designs should accommodate these differences with regard to the type, scale, and the layout of equipment. Daycares need to ensure that only age appropriate playground equipment are installed for their usage. School playground equipment is not age appropriate and does not met the requirements for children under the age of 5 years old. School playground equipment is intended for children 5-12 years of age.

The safety of each individual piece of playground equipment as well as the layout of the entire play area should be considered when designing or evaluating a playground for safety. Since falls are a very common playground hazard pattern, the installation and maintenance of protective surfacing under and around all equipment, regardless of whether the equipment is natural or commercial, is crucial to protect children from severe head injuries.

GENERAL PLAYGROUND CONSIDERATIONS

SELECTING A SITE:

The following factors are important when selecting a site for a new playground:

Site Factors	Questions to Ask	Mitigation
Travel patterns of children to and from the playground. Is there proper accessibility.	• Are there hazards in the way? • Can they be removed? • Are there conflicting activities? • Is the site accessible to all students including those with special needs?	• Clear hazards. • Ensure appropriate access. • Organize play areas into sections to prevent injuries from children running between activities. • Active, physical activities should be separate from more passive activities. • Ensure surfacing allows accessibility to all. • Choose equipment that can be accessible to all, including wheelchairs.
Nearby accessible hazards such as roads with traffic, lakes, ponds, streams, drop-offs/cliffs, etc.	• Could a child inadvertently run into a nearby hazard? • Could younger children easily wander off toward the hazard?	• Provide a method to contain children within the playground. For example, a dense hedge or a fence. • The method should allow for observation by supervisors. • If fences are used, they must conform to local building codes.
Sun exposure	• Is sun exposure sufficient to heat exposed bare metal slides, platforms, steps, & surfacing enough to burn children? • Will children be exposed to the sun during the most intense part of the day	• Bare metal slides, platforms, and steps should be shaded or located out of direct sun. • Provide warnings that equipment and surfacing exposed to intense sun can burn. • Consider shading the playground or providing shaded areas nearby.
Slope and drainage	Will playground areas drain properly or be flooded/ have standing water for extended periods of time?	Ask Facilities to survey the area for low lying problem areas prior to deciding on a location. Proper drainage is a mandatory requirement for all playground installations.

SELECTING APPROPRIATE EQUIPMENT:

When selecting playground equipment, it is important to know the age range of the children who will be using the playground. Consideration should also be given to providing play equipment that is accessible to children with disabilities and encourages integration within the playground.

Examples of age appropriate equipment:

Toddler: 6-23 months	Preschool: 2-5 years	Grade School: 5-12 years
• Climbing equipment under 32" high • Ramps • Single file step ladders • Slides • Spring rockers • Stationary play equipment • Stairways • Swings with full bucket seats	• Certain climbers • Horizontal ladders less than or equal to 60" high for ages 4 and 5 • Merry-go-rounds • Ramps • Rung ladders • Single file step ladders • Slides • Spiral slides up to 360° • Spring rockers • Stairways • Swings – belt, full bucket seats (2-4 years) & rotating tire	• Arch climbers • Chain or cable walks • Free standing climbing events with flexible parts • Fulcrum seesaws • Ladders – Horizontal, Rung, & Step • Overhead rings • Merry-go-rounds • Ramps • Ring treks • Slides • Spiral slides more than one 360° turn • Stairways • Swings – belt & rotating tire • Track rides • Vertical sliding poles

EQUIPMENT NOT RECOMMENDED:

Some playground equipment is not recommended for use on school playgrounds, including:

- Trampolines; giant slides; climbing ropes that are not secured at both ends.
- Heavy metal swings (e.g., animal figures) – These are not recommended because their heavy rigid metal framework presents a risk of impact injury.
- Multiple occupancy swings – With the exception of tire swings, swings that are intended for more than one user are not recommended because their greater mass, as compared to single occupancy swings, presents a risk of impact injury.
- Rope swings – Free-swinging ropes that may fray or otherwise form a loop are not recommended because they present a potential strangulation hazard
- Multi person – umbrella style spinners – The weight of multiple persons causes the spinner to travel at high speeds, resulting in children flying off the structure typically falling outside the fall protection zone.

APPROPRIATE PLAY SURFACING:

The surfacing under and around playground equipment is one of the most important factors in reducing the likelihood of life-threatening head injuries. A fall onto a shock absorbing surface is less likely to cause a serious head injury than a fall onto a hard surface. However, some injuries from falls, including broken limbs, may occur no matter what playground surfacing material is used.

Grass, dirt and landscaping wood mulch are not considered protective surfacing because wear and environmental factors can reduce their shock absorbing effectiveness. General landscaping wood mulch may contain branches, nails, sharp objects, treated wood products, etc. and is therefore not considered appropriate play surfacing. All play surfacing must be IPEMA certified and must be accompanied by a certificate of proof.

Pembina Trails school division requires all play surfacing to be IPEMA certified engineered wood fibre. Wood fibre must maintained at a minimum of 12inches deep and be surrounded by ACQ 6" x 6" timber edging. Plastic edging materials will not be accepted.

ASSEMBLY, INSTALLATION & FIRST USE:

All playground equipment must be installed/repaired by an approved installation company (trained/certified on the CSA standard Z614: Children's Playspaces and Equipment). Parents, parent committees, daycares, community organizations, untrained contractors, etc. are not allowed to install/repair playground structures. Assembly and installation must adhere to the following:

- Strictly follow all instructions from the manufacturer.
- Secure anchoring is a key factor to stable installation, and the anchoring process should be completed in strict accordance with the manufacturer's specifications.
- Powered mobile equipment for digging/landscaping/moving must only be operated by trained/certified operators.
    - All grading and drainage must be installed as per pre-approved drawings and must be inspected prior to the application of play surfacing material. Drainage is mandatory and must be pre-approved by Facilities.
- After assembly and before its first use, equipment must be thoroughly inspected by a certified playground safety inspector for safety.
- The manufacturer's assembly and installation instructions, and all other materials collected concerning the equipment, must be kept in a permanent file by the school division. Copies can be provided to the parent committee.

CONSTRUCTION REQUIREMENTS

CONTRACTORS:

- All contractors installing playground equipment must be trained/certified on the CSA standard Z614: Children's Playspaces and Equipment.
- All contactors must undergo a contactor orientation prior to starting work. See the small contractor orientation booklet.

PERMITS:

- A City of Winnipeg development permit is required for any installation of a commercial product (play structure) and is often required where the City of Winnipeg is one of the funding agencies. The contractor is responsible to obtain such permit and the bear the costs associated with the permit.

DRAWINGS:

- The contractor/architect shall submit an electronic copy of the playground drawings to the school division.
- The drawings must include all distances and measurements for playground equipment (including natural play spaces) as well as play surfacing, wear mat installation and drainage requirements.
- Schools must have a written letter of approval from Facilities & Operations Department prior to any play spaces being installed.
- Drawings must be reviewed by the safety department to ensure they adhere to the requirements of the CSA standard. The safety department has certified playground inspectors that know and understand the CSA requirements.
- An electronic copy of product data must also be submitted and should include: manufacturer's catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- Drawings must be approved by Facilities & Operations Department, Safety Dept. and the school administrator prior to any work being initiated.
- The contactor/architect is required to demonstrate how the new play structure will be drained. A land survey may be required.

FUNDING/GRANTS:

- Final Divisional approval authorizing the purchase of any equipment or construction will not be granted until Parent Advisory committees/ schools have sufficient monies (funding/grants) in hand to cover the entire cost of the purchase and installation.
- Grants for playground installations may be obtained by applying at the following locations (note this is not an exhaustive list):
  - The Winnipeg Foundation -
    - https://live-wpgfdn.pantheonsite.io/granting/
    - Support for community projects less than $100,000 for registered charities that serve our community.

  - Hometown Manitoba
    - https://www.gov.mb.ca/agriculture/rural-communities/economic-development/hometown-manitoba.html
    - This grant provides financial support for rural and northern community projects initiated by local communities, organizations, co-operatives and businesses that enhance public places and buildings. The program also is intended to promote unique identities and themes that define a community.

  - Recreational Grant Links
    - https://www.strideplace.ca/recreational-grant-links/#:~:text=Community%20Places%20Program%20(CPP),-Web%20Link%3A&text=Eligible%20projects%20are%20those%20which,eligible%20to%20apply%20to%20CPP.

  - Manitoba Grants Online:
    - https://www.gov.mb.ca/grants/
    - Manitoba Grants Online, a new one-stop portal for non-profit organizations to access a variety of government grants. Manitoba Grants Online currently features grant offerings from four departments - Municipal Relations, Agriculture, Sustainable Development and Sport, Culture and Heritage.

  - Manitoba Liquor & Lotteries
    - http://www.mbll.ca/content/community-support
    - Support a wide range of charitable, non-profit and community groups in meaningful, impactful ways – contributing millions of dollars, and thousands of employee volunteer hours, that add lasting value to the lives of Manitobans through festival and event sponsorships and donations.

- Aviva Community Fund
  - https://www.aviva.ca/en/tools/acf/aviva-community-fund/
  - The Aviva Community Fund invests in charitable community initiatives across Canada to strengthen the local community. There are two levels of funding for this grant, less than $50,000 and $50,000-$100,000.

- Community Foundations of Canada
  - http://communityfoundations.ca/
  - Matching grant for up to $15,000 please visit the Community foundations of Canada website for eligibility requirements and to find a Community Foundations of Canada location near you.

- Rick Hansen Foundation
  - https://www.rickhansen.com/become-accessible/bc-accessibility-grants-program
  - Through the Rick Hansen Foundation provides grants to schools and community groups to help Canadians complete infrastructure improvement projects and awareness building events to help remove physical barriers in schools and communities spaces and create awareness about accessibility all across Canada.

- Tire Stewardship Manitoba (TSM)
  - https://www.tirestewardshipmb.ca/tire-recycling-manitoba/municipalities
  - The Tire Stewardship Manitoba (TSM) Community Demonstration and Innovations Grant Program provides funding for the use of recycled tire products made from Manitoba tires in projects delivered by local governments, post-secondary and research institutions, community and youth groups, Aboriginal organizations, and First Nation communities. Onetime matching grants up to project levels of $5,000, $10,000 or $20,000 are provided to communities and non-profit organizations to use and benefit from a wide range of recycled tire products.

- Co-op Community Spaces
  - https://www.co-op.crs/articles/detail/community+spaces
  - The Co-op Community Spaces Program is helping build and support communities across Western Canada. The program provides $2 million to projects related to community-based recreation, environmental conservation and urban agriculture projects.

GENERAL HEALTH & SAFETY REQUIREMENTS - CONTRACTORS

- Upon award of the contract, the successful contractor shall be required to undergo a safety orientation and complete and review the Pembina Trails School Division Small Contractors Orientation policy and sign the agreement form. https://www.pembinatrails.ca/WhatWeOffer/SafetyHealthandEnvironment/Safety/ContractorsProgram/Pages/Small-Contractor-Program.aspx
- Each worker on site shall be familiar with the school divisions Small Contractors Orientation policy, and shall sign the declaration form as required by the school division.
- The installation contractor shall conform to all occupational health & safety codes in effect provincially and locally, to the latest edition and supplements.
- The contractor shall ensure all notices are posted as required by regulatory agencies and codes. Ensure all warnings and equipment required to be used are posted. All permits for codes and safety requirements are obtained and posted.
- Erect all barricades, guardrails, hoarding and enclosures necessary to protect public, workers, public and private property from injury and damage.
- General contractor and all sub-contractors shall provide all necessary equipment to make work site safe for all workers, invited attendees and spectators.
- General contractor shall ensure that all site workers (including sub-contractors) and invited attendees are conforming to applicable safety rules and have prerequisite personal protective equipment in use.
- All workers on site must have been trained and have applicable certification on the type of job to be performed, (example; Fall Protection). Proof of certification will be required to be produced upon request by owner's representative.
- All workers operating powered mobile equipment (PME) shall be trained and certified in the operation of this equipment. Proof of certification will be required to be produced upon request by owner's representative.
- Provide a work and site safety plan for review, by owner's safety officer prior to equipment and workers arriving on site.
- Comply with requirements of all federal, provincial and municipal regulations.
- Provide protective equipment as required by the applicable insurance companies.
- Smoking, drug use and alcohol is not permitted on school division property.

TEMPORARY UTILITIES:

- Provide temporary utilities controls in order to execute work expeditiously.
- Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
- Provide and pay for continuous supply of potable water for construction use.
- Provide and pay for temporary power during construction for temporary lighting and operating of power tools.
- Provide and maintain temporary fire protection equipment during performance of work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- Burning rubbish and construction waste materials is not permitted on site.

CONSTRUCTION FACILITIES/REQUIREMENTS:

- Site storage – All site storage must be approved prior to use. Do not unreasonable encumber the site with materials or equipment. Do not move stored products or equipment that may interfere with the school playground or other contractors on site.
- Washrooms - provide sanitary facilities for construction workers in accordance with governing regulations. School washrooms may not be used by contractors or their subs.
- Temporary barriers & enclosures - temporary site enclosures must be erected around the entire work site prior to the start of work and maintain for duration of work.
    - Enclosures must be constructed out of 1830 mm high modular wire mesh fence panels with portable bases and removable fence posts.
    - Include lockable access gate for worker and vehicular traffic.
    - Post signage on fencing for safety and instruction in both official languages in and with graphic symbols to CAN/CSA-Z321.
    - Protect work against damage until take-over.
    - Protect adjacent work against the spread of debris and dirt beyond the work areas.
    - Protect operatives and other users on site from all hazards.
    - Protect existing surfaces adjacent to and beyond area of work from damage. Prevent damage by providing panel materials required to distribute loads on hard and soft surfaces when operating construction vehicles and equipment.

- Site access - access to the site as required by contractor shall be provided and maintained by contractor at his own expense and approved by owner's representative. The contractor shall limit their operations to minimum area necessary for undertaking work and be responsible for all damage resulting from work on private property.
- Site examination and preparation - before commencing work, establish the location and extent of services lines in area of work and notify owner's representative of findings.
- Damage to existing structures, trees and property – the contractor shall exercise necessary precautions so as not to remove, disturb, or damage existing trees, shrubs, sod, pavements, streets, roads, boulevards, poles, hydrants, water pipes, gas pipes, electrical wires, cables, conduits, sewers or other existing facilities and equipment at place of work.
    - For damage incurred in performance of work, either directly or indirectly, contractor shall either replace or repair such damage, whichever may be deemed necessary in opinion of and acceptable to owner, and cost of which shall be borne entirely by contractor.
    - Indemnify and save harmless owner and owner's representative from claims made directly or indirectly against it in respect to any such damage.
    - Take precautionary steps to prevent damage from construction activities to existing trees within the limits of the construction area:
        - Do not stockpile materials and soil or park vehicles and equipment within 2 meters of trees and as indicated.
        - All trees within scope of work are to be strapped with 25x100x2400 wood planks, or suitable protection as approved by owner's representative prior to start of construction.
        - Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 18 times the diameter from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
        - Operation of equipment within the drip line of the trees shall be kept to a minimum required to perform the work required. Equipment shall not be parked, repaired, refueled; construction materials shall not be stored, and earth materials shall not be stockpiled within the drip lines of trees. The drip line of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches.

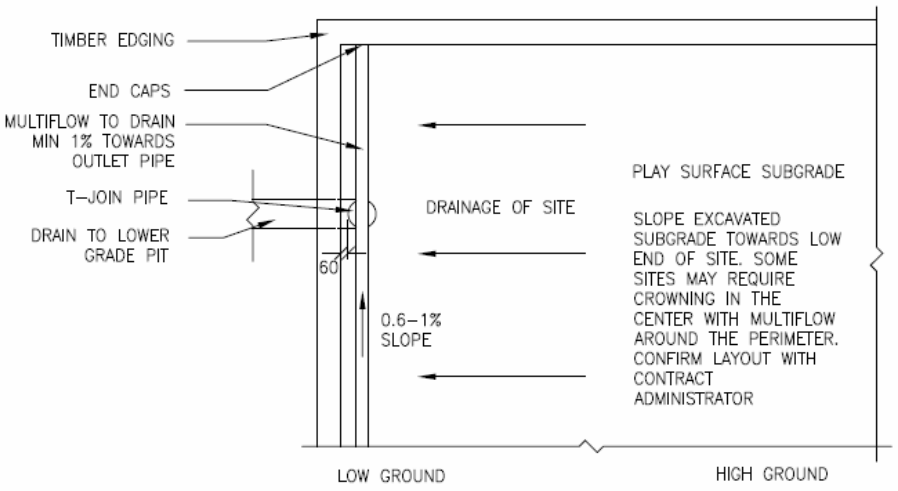
- Cut, patch and make good - cut existing surfaces as required to accommodate new work.
  - Remove all items so shown or specified.
  - Patch and make good surfaces cut, damaged or disturbed, to owner's representative's approval. Match existing material, colour, finish and texture.
  - Unless otherwise specified, materials for removal become the contractor's property and shall be taken from site.
- Waste management - separate waste materials for reuse and recycling and dispose of materials at appropriate facility.
  - Do not burn, or bury waste materials.
  - Do not dispose of waste materials in waterways, storm, and sanitary sewers.
  - Dispose of unused paint, adhesive, caulking material, volatile materials at official hazardous waste material collections site.
- Clean-up - clean up as work progresses. At the end of each work period, and more often if ordered by the owner's representative, remove debris from site, neatly stack material for use, and clean up generally.
  - Wood fiber and granular materials: limit spread of materials to work area. Prevent materials from entering catch basins and water management systems.
  - Upon completion remove temporary protection and surplus materials. Make good defects noted at this stage.
  - Clean manufactured articles in accordance with manufacturer's written instructions.
  - Clean areas under contract to a condition equal to what previously existed and to approval of owner's representative.

EXCAVATION & GRADING:

- All extraneous materials are to be removed from the site and disposed of in a safe and legal manner.
- The work to be done by the contractor under this specification shall include all labour, equipment and material necessary for and incidental to the satisfactory performance and completion of the work herein specified.
- Work shall include but not be limited to the following:
- Excavate, add clean fill if necessary, and grade to the limits shown on the drawings below to the depths necessary to achieve finish grade for:
- Excavation includes the removal of items (i.e., sand, pea gravel, earth, timber edging) as indicated on the drawings and as directed by the owner's representative.
- Work includes the satisfactory disposal of unsuitable site material such

as clays susceptible to frost-heaving, silts, rock, rubble, rubbish and any surplus suitable site material.

- Stockpile suitable, approved material on site for reuse (clean topsoil, clean earth fill,) in a secure location. Remove and dispose of unsuitable material.
- Disposal of material shall be understood to mean the hauling of all unsuitable material from the site and the unloading in a legal manner acceptable to the owner's representative. If arrangements are made in advance excavated material may be disposed of on site at a location designated by the owner's representative.



C5 L103 **PLAYGROUND DRAINAGE PLAN**

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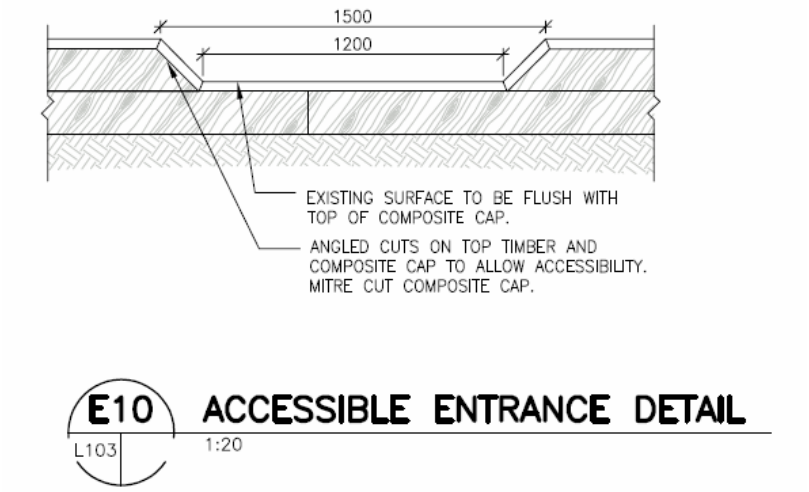
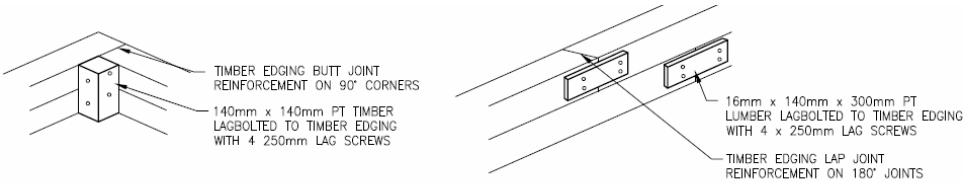
TIMBER EDGING INSTALLATION:

- The contractor shall furnish all labour, materials, equipment and services necessary to complete the work according to the drawings and specifications.
- This specification shall cover the supply and installation of double-tier timber edging to contain the wood fiber safety surfacing in the new play area as per drawings.
- Materials and Installation
  - Caps shall be 25 x140mm Pedra or Composite as per drawings or comparable product approved by owner's representative. Screws shall be coated for composite to ACQ use and sized to suit as per drawings.
  - All timbers shall be alkaline copper quaternary (ACQ) pressure treated spruce, pine or fir, No. 2 or better, no wane, bark, checking or splitting permitted. Wood shall be smooth and free of rough areas. All timbers to be 140 x 140mm with a minimum length of 1200mm. All ends and cuts shall be treated with preservative before being secured. Use longest lengths possible.
  - Edging material shall be cut neatly for a proper fit with no spaces or gaps between. Finished elevations shall ensure that all edging material is smooth, level, set plumb and spaced uniformly. Joints to be butt joints. Joints in straight runs are to be lapped over timber by a minimum of 600mm.
  - Butt joints to be reinforced as per drawing detail
  - Turf shall be repaired as required around edging in accordance with City of Winnipeg Standard Specifications for Sodding.





D10 JOINT REINFORCEMENT DETAIL

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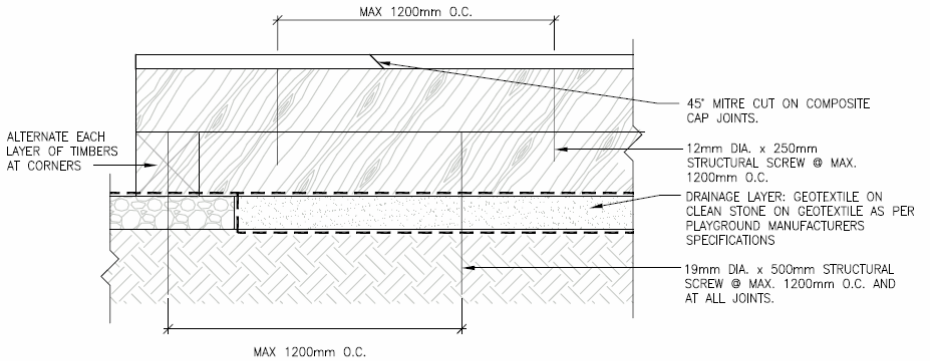


NOTES:
BASE COURSE TIMBER:

- BASE COURSE TIMBERS SHALL BE PINNED WITH A MIN. OF 2 19mm DIA BY 900mm STRUCTURAL SCREWS AT MAX 1200mm O.C.
- ALL ROWS OF TIMBER ABOVE BASE COURSE SHALL BE SECURELY FASTENED WITH A MIN. OF 2 12mm DIA BY 250mm STRUCTURAL SCREWS AT MAX. 1200mm O.C.
- TIMBERS SHALL BE CUT NEATLY FOR A PROPER FIT WITH NO SPACES OR GAPS IN BETWEEN. ENSURE ALL EDGING MATERIAL IS SMOOTH, LEVEL AND PLUMB. NO WOOD FILLER TO BE USED.
- PRESERVATIVE MUST BE APPLIED TO ALL END CUTS.

CAP:

- SHALL BE PRE-DRILLED AND SCREWED DOWN USING SCREWS TREATED FOR COMPOSITE TO ACQ USE AND SIZED TO SUIT. SCREWS TO EXTEND INTO TIMBER BASE AT MIN. 50mm AND TO BE COUNTERSUNK INTO CAP. TWO PARALLEL SCREWS EVERY 600mm O.C. ALONG LENGTH AND T ENDS. ONLY USE BUTT JOINTS FOR STRAIGHT SECTIONS OF PEDRA. MIN. LENGTH OF TIMBERS TO BE 1200mm. INSTALL LONGEST LENGTHS POSSIBLE.

TOPSOIL AND SOD/SEED REPAIRS;

- ENSURE POSITIVE DRAINAGE AWAY FROM PLAY AREA – MIN. 1% MAX. 10% SLOPE. (IF SOD IS SPECIFIED, USE ONE FULL WIDTH OF SOD)

A10 TIMBER EDGING DETAIL

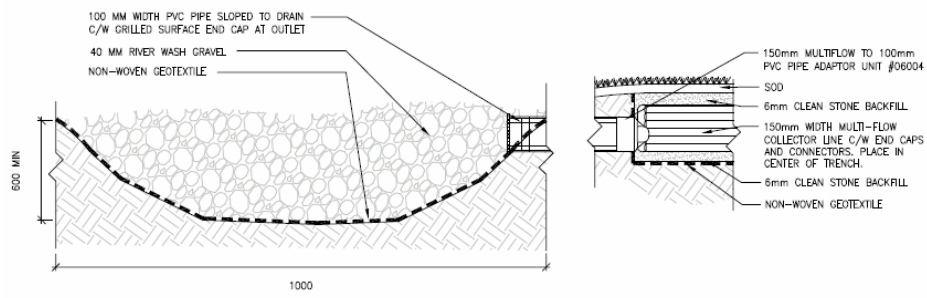
1:10

SUB-SURFACE DRAINAGE:

- This work shall consist of providing and placing a geocomposite prefabricated drain system to drain the play area, and connection to a drain pit, as shown on drawings.
- This work shall include the subsurface drainage to drain new playground surfacing, as described in the drawings below.
- Materials:
  - Drainage pipe will be Multi-Flow. Drainage pipe will be 150 mm (6”). The manufacturer will size and approve all fittings for use with Multi-Flow.
  - The drain conduit shall be of flexible, prefabricated, rounded rectangular shaped, composite product.
  - The drain conduit will be wrapped with a non-woven geotextile and will be a non-woven needle-punched construction and consist of long-chain polymeric fibers composed of polypropylene, polyethylene or polyamide.
  - The fibers will be oriented into a multi-directional stable network whereby they retain their positions relative with each other and allow the passage of water as specified.
  - The fabric will be free of any chemical treatment or coating, which reduces permeability and will be inert to chemical commonly found in soil.
  - The geotextile will conform to the following minimum average roll values.

Weight	ASTM D-3776	3.0 - 4.0
Tensile Strength	ASTM D-4632	100 - 130
Elongation %	ASTM D-4632	50 - 70
Puncture, lb	ASTM D-751	35 - 60
Mullen Burst, psi	ASTM D-3786	110 - 215
Trapezoidal Tear, lb	ASTM D-4533	40 - 42
Coefficient of Permeability	ASTM D-4491	.2 - .4 cm/sec
Flow Rate, gpm/ft2	ASTM D-4491	100 - 140
Permittivity, 1/sec	ASTM D-4491	1.3 – 2.0
Apparent Opening Size	ASTM D-4751	60/70 Max. US Std Sieve Opening
Seam Strength, lb/ft	ASTM D-4595	100
Fungus	ASTM G-21	No Growth

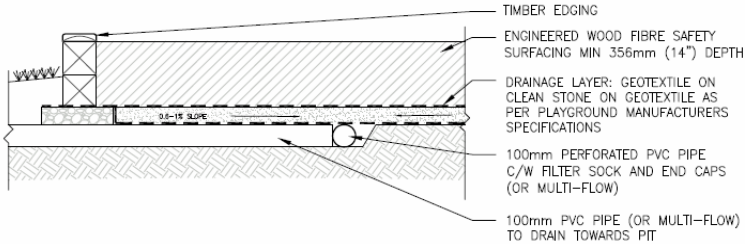
- The drainage core shall be made of a high-density polyethylene. The core shall be constructed using interconnected corrugated pipes that define and provide the flow channels and structural integrity of the drain. The geotextile shall function only as a filter. The core of the edge drain shall conform to the following physical property requirements: 1.0 inches thickness; flow rate of 29 gpm/ft; compressive strength of 6000psf; pipe stiffness, 100 pii.
- The fittings used with the edge drain shall be of a snap together design. In no case shall any drainage product be joined without the use of the manufacturer's connector designed specifically for the purpose. Cleanouts will be provided as indicated on the drawing.
- Pipe for drain outlet laterals will be either 75 mm (3") PVC pipe meeting the requirements of ASTM D-2729 or ASTM F-949, or high-density polyethylene pipe meeting the requirements of AASHTO M252.
- A rodent screen made of 0.3 inch by 0.3-inch square opening size, 0.063-inch gauge, stainless steel or galvanized, welded wire mesh shall be installed in each outlet lateral line. When using galvanized welded wire mesh, the rodent screen shall be galvanized after it has been formed to the shape and dimensions of the pipe.
- Drainage pit shall be as per the drawings below and based on a survey of the area in collaboration with the property owner.



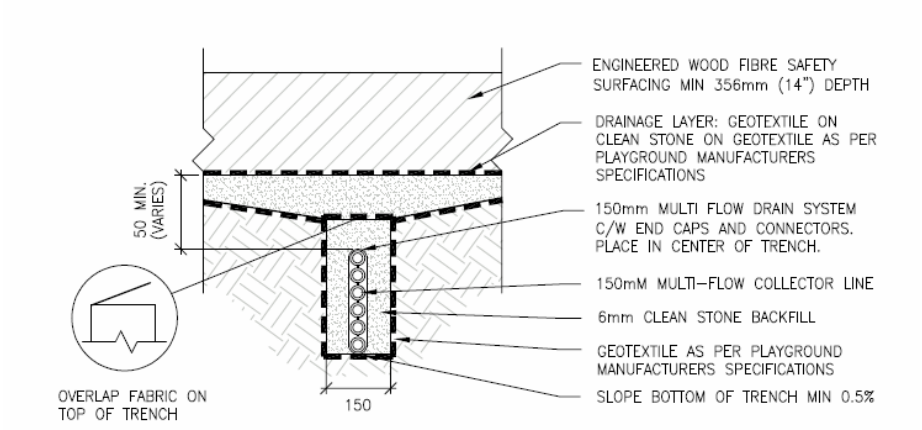
A5 L103 SWALE AND DRAIN OUTLET 1:10

SUB-SURFACE & DRAINAGE INSTALLATION:

- Installation of sub-drain is not to proceed until after the excavation/grading has been approved by the owner's representative. Notify owner's representative at least 48 hours before inspection.
- The layout of the sub-drain is to be marked on site and approved by the owner's representative prior to trenching. Notify owner's representative at least 48 hours before inspection.
- Sub-drain within the play area is to be laid on the prepared surface to facilitate cross movement of water. Sub-drain shall be installed below geotextile and in conformance with details provided.
- Play area to be graded to drain towards sub-drain. This sub-drain is to be used in conjunction with the appropriate wood fiber drainage layer to bring excess water out of the play area.
- Trenches are to be inspected by the owner's representative prior to backfilling. Notify owner's representative at least 48 hours before inspection.
- Pipe is to be placed in the trench and the trench is to be backfilled according to detail Drawings. Backfill is to be lightly tamped into place to eliminate any voids.
- Fittings for the drain shall be installed in accordance with manufacturer's recommendations.
- The contractor shall be responsible for restoration of any surfaces damaged during the work under this section.
- Contractor is to protect sub-drain from excessive weight during the duration of construction and to repair and make good any pipe collapsed prior to acceptance.
- Any damaged edge drain, or outlet lateral will be replaced or repaired by splicing in an undamaged section of drain at the contractor's expense. The repair must be in accordance with the manufacturer's specification and to the satisfaction of the owner's representative
- Outlet pit location will be within 2 meters of general location specified on drawings.



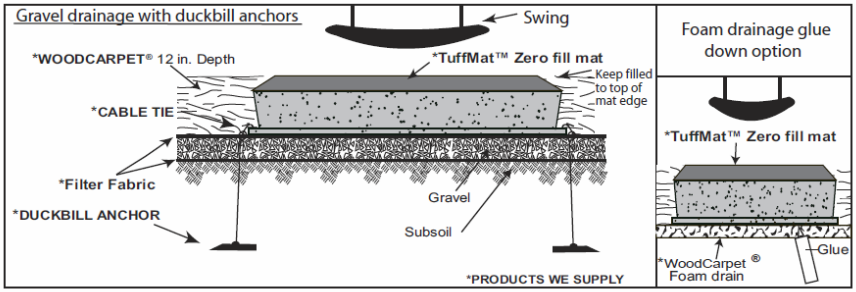
B5 L103 DRAINAGE DETAIL 1:20



PROTECTIVE SURFACING:

- This section covers the supply and installation of engineered wood fibre surfacing within the play equipment Area.
- Materials:
  - Wood fibre product shall be Zeager Woodcarpet. Playgrounds R Us substitute may be used but only when purchasing PRU playground equipment.
  - Wood Fibre surfacing shall be supplied by an authorized distributor and Delivery Slips and **IPEMA Certificate** from an authorized supplier are to be submitted to the Owner's Representative prior to installation.
  - Contact for Woodcarpet:
    Zeagar Bros. Inc.
    4000 East Harrisburg Pike
    Middletown, PA 17057, USA
    Ph.: (1-888) 346-8524 or (717) 944-7481 ·
    Fax (717) 944-7681
    sales@zeager.com

- Wood fibre surfacing shall include wood fiber, filter cloth, subsurface drainage system and mats under swings and ends of slides.
- Mats are to be Zeager Tuff Mat Zero-Fill Mats installed directly on top of drainage layer and secured in place with four (4) duckbill anchors per mat. Mat type must allow anchoring. Provide wearing mats in minimum sizes as follows:
  - 32”x32” for single slides
  - 32”x62” for double slides
  - 32”x62” for swings
  - 32”x62” for accessible entrance
  - 72”x72” for tire swings and spinners
  - 72”x90” for swing bay
  - 36”x48” for universal
- Quality Assurance: Submit manufacturer’s Certificate of Insurance for $10,000,000 product liability, and sample warranty. See drawings for sizes.

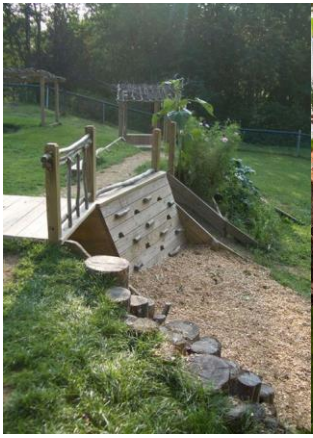


E. Application: Kick-out areas on outdoor playground surfaces (ie. swings, ground level components, and slide exits)

PROTECTIVE SURFACING INSTALLATION:

- Wood fibre shall be installed within the play areas, as defined by the timber edging to a minimum depth of 350 mm (after compaction). In the case where proposed play equipment includes a maximum fall height greater than 2.4m (8'), depth of material to directly correspond to maximum fall height of play equipment in accordance with manufacturer's specifications.
- Installation of entire system, including fiber, filter cloth, subsurface drainage and mats under swings and slide ends shall be done according manufacturer's instructions. Adequate drainage within play equipment area must be ensured as per same.
- Mud grade of play area shall be graded to drain to one edge of the play area, and area cleared of any debris which inhibit proper drainage or installation of products. Drainage pipe shall be installed from the subsurface drainage system within the play area to run outside of the play area perimeter to drain into an existing catch basin. The cost of this shall be included in the price for the wood fiber supply and installation.
- Filter fabric must be cut and fit around playground equipment footings and existing trees and shrubs. Overlap seams by 300mm.
- Installation shall be done by equipment sized to suit the Work being done and the wood fibre shall be spread by hand as necessary in the immediate vicinity of the play equipment and existing vegetation so as not to damage same. The play equipment shall be swept clean to the satisfaction of the owner's representative after installation of the wood fibre.
- The supplier must provide the school division with a copy of the engineered wood fibre IPEMA certificate upon delivery of the product.

NATURAL PLAYGROUND INSTALLATIONS



A common misconception implies that natural playgrounds cannot be designed to meet required safety standards. This is false. All playgrounds whether architecturally designed using plastic molded pieces or natural designed playgrounds using berms/embankments and logs, etc. must meet the minimum requirements of the CSA Z614 standard.

BURMS OR HILLS:

Kids love berms and hills, but they are a maintenance concern, being dusty when it is dry and muddy when it is wet. Turf cover lasts only 1 or 2 years before its trampled and worn away. Berms also must not contain any rubble or construction debris. Problems with berms/hills include the following:

- Difficult to keep grass growing, and in winter months schools ask for them to be sand/salted due to sliding or slip and fall accidents. The salt contaminates the soil and kills the grass. Facilities & Operations department not approve sand/salt to be used on playground surfaces.
- Trees in association with berms (in active play areas of the schools), will be stressed from erosion, compaction and exposed roots. If trees are specified, they are required to be planted at the base of the slope where the mulch will stay in place and away from sledding areas.

- Hills must be kept low to reduce the risk associated with slip and falls and sledding speeds. Low hills that are 450-600mm (1.5 - 2 '

or 3-5') high with gradual slopes of 15-20% still provide fun for children. Hills should not exceed a 3:1 slope (33%).

- If steeper hills are required, pavement or rubber safety surfacing may be necessary to avoid erosion – this may include terracing or stepping (timber or stone). Landscape features at the base or along the slope of hills could be a winter sliding safety concern.
- Consider using berms made entirely of mulch in areas away from catch basins. They work well but must be replenished annually or biannually.

SLIDES – EMBANKMENT SLIDES:

Embankment slides are slides that have been placed into the sides of a hill. The hill should be sculpted to follow the shape of the slide. This is important as it allows for the decrease in the critical fall height to 0mm (0"). With no fall height and a protective surfacing zone at the exit of the slide, schools are able to decrease the amount of impact attenuated surfacing required (this can be considered a budgetary break that can be used for other playground items such as shade plantings and vegetation. However protective surfacing is still required at the slide exit.

Embankment slides must still meet the requirements of the CSA standard and at a minimum must be:

- Slide entry shall be 550mm in depth and approx. horizontal;
- Be at least as wide as the slide bedway;
- Provide a means to channel the user into a sitting position at the slide entrance (guardrail, hood, natural elements or other device that discourages climbing);
- Slide exit height:
  - Slides with an elevation <1.2m, exit height shall not be less than the finished grade and not greater than 275mm above the protective surfacing.
  - Slide with an elevation of >1.2m, exit height shall be between 175 and 380mm above the protective surfacing.
  - Slide exits shall be designed to discourage buildup of snow and debris accumulation that could inhibit visibility and block the slide exit. Slide side plantings can be used to prevent erosion along the sides of the slides; these plantings must conform to clearance zone rules and also create a pleasant aesthetic.
  - The fall height of an embankment slide shall never be greater than 1.0m.

HANDRAILS/GUARDRAILS/ STAIRS:

Guardrails, handrails and stairs, regardless of the material they are made from, still require handrails. Guardrails are also required around all platforms and elevated surfaces.

MULCHES:

Avoid using wood chips, and “wood chip” terminology when suggesting the use of mulch in school grounds. Do not confuse wood mulch with engineered wood fiber, they are different. Use shredded hardwood or softwood mulch that is processed by a tub grinder or log peeler---- tends to mat together and stay in place.

- there is a safety concern with wood chips being thrown by lawnmowers.
- wood chips also float during heavy rainfalls and plug up catch basins and cause flooding.
- free forestry chipper mulch should not be used unless it is a long way from the school building and away from catch basins – long strands of wood plug up catch basins and are a safety concern with children. Free forestry chipper mulch can be used as a base but should be covered with a finer mulch.
- mulches should be used in high traffic areas (i.e. transition zones between asphalt play areas and playing fields) at 150mm (6”) settled depths, rather than sod.
- Mulch should initially be 100mm (4”) settled depth on planting beds, 150mm (6”) settled depth over existing exposed tree roots, around newly planted trees or for pathways, and needs to be replenished every year.
- A minimum of 1/2 cubic yard is required for newly planted standard trees. At approximately 4-5 cu.ft. of mulch per wheelbarrow, at least 3 full wheelbarrows are required for each tree.
- there needs to be substantial definition between mulch and catch basins:
    - 3 - 4.5m (10’-15’) of asphalt or sod skirting timber or rock retainer
    - there should be no filter cloth (geo-textile) installed under landscape mulch.
- all perimeter containment should be designed and constructed to maintain a level surface for the mulch and to reduce migration of the material into grass or onto other surfaces.

ANY TYPE OF NATURAL STRUCTURES:

Any type of natural structures including climbers, structures, balance beams, swings, rotating equipment, track rides, cable rides, climbing structures, etc. must meet the requirements of the CSA standard, including those for fall protection and protective surfacing.

PROTECTIVE SURFACING:

Natural Playgrounds may consist of four different surfaces:

- Grass
- Sand (in sand play areas)
- Engineered wood fiber (the required surface for play structure areas)
- Paths (stone dust, asphalt, mulch paths)

Pembina Trails SD requires all protective surfacing to be IPEMA certified engineered wood fiber. Wood fiber must be installed at a finished depth of 300mm (12") to achieve a critical height of >3m. Surfacing must have drainage and be packed between layers to achieve a final depth of 12" after settling.

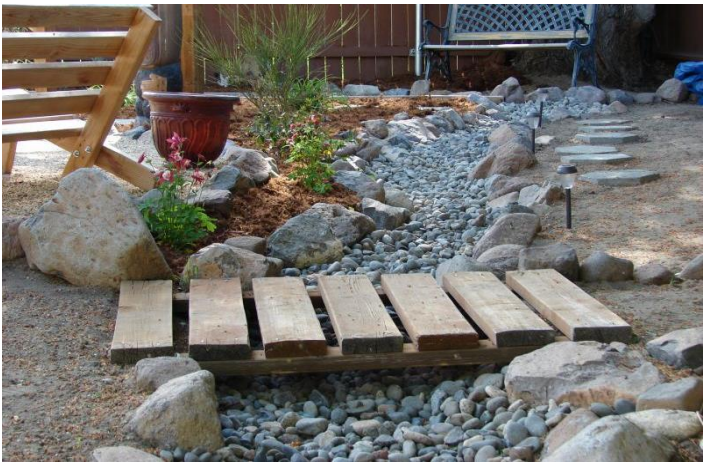
SHARP OBJECTS/EDGES ON LOGS AND STUMPS:

All logs/stumps must be sanded to eliminate sharp edges left over from old branches. Branches must be cut back all the way to the main log and then sanded smooth. Ends must be rounded or chamfered and sanded smooth to prevent sharp corners.

Wooden stumps are not allowed to be used as play equipment. They are allowed to be used as edging, but the preference is to use horizontal logs for all edging. Any vertical tree stumps, if used, must be untreated, abutted up to each other so there are no gaps. At least ½ of the stump must be buried in the ground to provide extra rigidity. Finished stump height must never be more than 305mm.

DRY CREEK BEDS:

Dry creek beds must not be located next to a downspout area that may trap or accumulate water. It should be designed so that it does not trap or accumulate water. The creek bed should be graded so that water drains away from play areas and does not accumulate anywhere along the bed (drowning hazards must always be eliminated). Creek bed rocks must be river washed that have rounded edges.



ROCKS/BOULDERS:

Sharp edges of boulders must be ground down. Granite is particularly sharp. On stone rocks/boulders all exposed edges need to be ground down to ¼" radius. Gaps between boulders need to be less than 3-4" or greater than 6.5 feet. Boulder/stone dimensions must be either too large to move or too small to throw. Any irregular shaped boulders must follow the gap references above.

NOTES