Design Guidelines for K-12 Outdoor Play and Learning Environments

Waterloo Region District School Board

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Acknowledgements

This edition describes best practices for K-12 outdoor play and learning environments. Material used in these guidelines has been sourced from the Evergreen publication *Landscape and Child Development: A Design Guide for Early Years – Kindergarten Play-Learning Environments*.

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Intent of the Guidelines

All users benefit from a well-designed school ground. These guidelines have been written to give Waterloo Region District School Board (WRDSB) school communities, including administrators, teachers, custodians, parents and design professionals a common understanding for discussing, planning, and implementing outdoor play and learning environments that connect children and youth to nature.

These guidelines encompass design ideas, construction details, and site management practices that incorporate innovation and long-term sustainability into the planning and design of natural school grounds in Waterloo Region, and support the WRDSB's Environmental Values policy that states:

The Waterloo Region District School Board will endeavour to design safe school grounds with an ecological focus, recognizing the importance of creating and sustaining healthy, natural school grounds that support child development and learning.

The guidelines are based on a set of design principles that are centred on meeting children's developmental needs – physical, cognitive, social, and emotional – from kindergarten to grade 12. They draw upon the lessons learned from the WRDSB's partnership with Evergreen and many school communities over the past fifteen years that has helped to transform school grounds into diverse, nature-filled learning environments.

As new research emerges, the guidelines will be updated to reflect that new learning, and integrate best practices.

These guidelines for creating natural outdoor play and learning environments in the WRDSB are to be used in conjunction with applicable Board Policies and Administrative Procedures and include the following:

- Facility Services Procedure 1400 - Outdoor Play and Learning Environment
  https://www.wrdsb.ca/facilities/operations/grounds/
- Administrative Procedure 4570 - Procurement
  http://www.wrdsb.ca/wp-content/uploads/AP4570-Procurement2.pdf
- Board Policy 2000 - Environmental Values
  http://www.wrdsb.ca/wp-content/uploads/2000-Environmental-Values.pdf
- Board Policy 2011 - Sun Safety and Shading
  http://www.wrdsb.ca/wp-content/uploads/CombinedP2011Sun-Safety-Shading.pdf

It is important to recognize that any and all proposed modifications to school sites require the approval of Facility Services and become the property of the WRDSB.

Nature and Child Development

Exposure to the natural environment can have a significant positive impact on childhood development, in terms of physical, social, emotional, and cognitive health. Current research makes it clear that our earliest experiences—the way we play, learn, and interact with the world around us as children—have a profound and formative effect on our health, thinking, and behaviour throughout our lives (Gopnik 2009).

From the earliest age, the ability to explore and have regular contact with nature (plants and animals) connects children to their world and helps to instill an early stewardship ethic. A child's sense of self (Phenice & Griffore 2003) and sense of wonder (Cobb 1977, Louv 1991) are developed in connection to the natural world.

It has also been found that when children play in natural environments, their play is more diverse, imaginative and creative, and fosters language and collaborative skills (Faber Taylor et al. 1998, Fjortoft 2000, Moore & Wong 1997). Children with exposure to natural environments also show advanced motor skills, including coordination, balance, and agility (Fjortoft 2001, Grahn et al. 1997).

As children get older, access to natural play and learning spaces are equally as important. Researchers have found that:

- Children with symptoms of Attention Deficit Hyperactivity Disorder (ADHD) are better able to concentrate after contact with nature (Faber Taylor et al. 2001)

- Children with views of, and contact with nature score higher on tests of concentration and self-discipline. (Faber Taylor et al. 2002, Wells 2000).

- Exposure to natural environments improves children's cognitive development by improving their awareness, reasoning and observational skills (Pyle 2002).

- Nature buffers the impact of life stress on children and helps them deal with adversity. (Wells 2003).

- Play in a diverse natural environment reduces or eliminates anti-social behavior such as violence, bullying, vandalism and littering, as well reduces absenteeism (Coffey 2001, Malone & Tranter 2003, Moore & Cosco 2000).

- Nature helps children develop powers of observation and creativity and instills a sense of peace and being at one with the world (Crain 2001).

- Children who play in nature have more positive feelings about each other (Moore 1996).

- Natural environments stimulate social interaction between children (Moore 1986, Bixler, Floyd & Hammutt 2002).

- Outdoor environments are important to children's development of independence and autonomy (Bartlett 1996), (White Hutchinson Leisure & Learning Group, 2004).

Chapter 1

Planning Principles for Outdoor Play and Learning Environments

> **In childhood one is more open to sensory impressions than ever again in one's life. Smells, sensations of heat, softness, weight, beauty and much more, form the basis of all of life's later sensations.**

Eva Insulander, Swedish School Ground Designer and Planner

Planning Principles for Outdoor Play and Learning Environments

Natural features play a central role in creating rich and stimulating outdoor experiences. However, creating a natural outdoor play and learning environment means more than simply planting trees, shrubs, and wildflowers. Good design that balances natural and built features is essential to realizing a school ground's potential to be a rich environment for play and learning.

To create a landscape that supports rich and authentic hands-on learning experiences on school grounds, the WRDSB and Evergreen recommend integrating the following ten design principles:

1. Follow a participatory approach

Get people involved. The participatory process involves working together and gathering input from students, teachers, parents, administrators, custodians, facility managers and community users to collectively create a vision, develop a plan, and implement natural play and learning spaces on school grounds.

See the Evergreen resource All Hands in the Dirt: A Guide to Designing and Creating Natural School Grounds http://www.evergreen.ca/en/resources/schools/all-hands/

2. Be cognizant of safety in design

Ensure the design for your outdoor learning area contributes to a safe space by considering the following points:

Keep sight lines open

- Do not plant trees in locations that would compromise safety by blocking sightlines, security cameras and/or night lighting.
- Avoid planting low-growing shrubs and other dense plantings next to building walls, parking lots and along the edges of walkways. It is important for people to be able to have clear sight lines.

Leave two ways out

- Make sure there are two ways in and out of paths and fenced areas.
- Avoid dead-end entrapment zones.

3. Design for all ages, stages, and abilities

It is important to consider all age and ability ranges in the design of natural outdoor play spaces. Consider scale, graduated levels of safe risk-taking, developmental needs (physical, social, emotional and cognitive) and sensory cues in these spaces across all age levels, developmental stages, and abilities. Also consider pick up and drop off zones and after hours use of the space by the surrounding community.

The design of natural play and learning spaces must ensure that children and youth of varying abilities have access to all major play and learning spaces. Incorporating all ages, stages, and abilities into the design of outdoor play and learning areas should begin early in the planning process with consideration for layout, seating, paths, and play components.

The Design Framework in Chapter 2 provides more detail linking developmental needs with design elements in the creation of natural play and learning spaces. The Building Natural Play and Learning Spaces in Chapter 4 outline specifications for accessible paths, seating, and play elements.

4. Create a diversity of spaces for outdoor play and learning opportunities

A landscape that offers a diversity of spaces is a rich environment for play and learning. Diverse landscapes are flexible spaces; they are suggestive, not prescriptive. They provide opportunities for play, learning, and movement that can be experienced different ways by students depending on how they are used. They can also be used in different ways throughout the seasons.

The WRDSB and Evergreen suggest priority be placed on five key spaces that work together to create a diversity of play and learning opportunities: Active, Experimental, Individual, Gathering and Ecological. These key spaces are explored in more detail in the Design Framework for Creating Outdoor Play and Learning Environments in Chapter 2.

Centennial Public School

5. Provide multi-purpose elements

The elements of an outdoor play and learning space should serve many purposes. Designing and choosing elements that can be used and interpreted in many ways is more challenging and imaginative than single-purpose "pieces". Consider the following:

- Create landmarks that function as distinct meeting spaces, and places for students to play.
- Mold the landscape in interesting ways and use vegetation to create rooms, arbors, tunnels, dens, and nooks that can be used for gathering, imaginative play, and nature study areas.
- Incorporate elements that serve many purposes. For instance, a flat-topped stone or log in a play area can be used as seating, a boat, a rocket ship, an island, a presentation stone, a table top, or any other imaginative use.
- Let an area of grass grow ("no mow" zone) that can serve as a nature study area, hide-n-seek space, or a maze with mown paths.
- Include wooden posts that can become the frame for a den or fort with fabric in the spring and fall, and with snow in the winter.
- Avoid mass repetition of the same feature in order to increase the quality of the landscape.
- When determining locations of play elements, take advantage of the spatial quality, sense of place and shade created by existing trees (Moore, Goltsman - Play for All Guidelines, 1992).

Forest Glen Public School

6. Design for year-round use

Many school playgrounds (climbers) are closed for the winter for safety reasons. Creating natural spaces for play and learning is key to optimizing the seasonal potential of school grounds. Play spaces designed for year-round use will highlight the multitude of opportunities presented by seasonal changes.

Use materials that can withstand the weather, and consider the changes to the space throughout the seasons including: wet, leaf covered, snow-covered or frozen. Additionally, seasonal changes affect fall heights and impact attenuation of surfaces. Consider how pathways and play elements will be used and maintained in all seasons, and design to maximize year-round use (e.g. logs that can be used for climbing in the spring and fall and for sliding in the winter).

In addition, a natural school ground provides opportunities for outdoor study in all seasons and weather conditions. Sun and rain shelters and natural wind-breaks accommodate teaching outdoors and help to extend classroom time outside. The use of evergreen trees, for example, provides winter interest and attracts wildlife.

7. Connect to curriculum

Many skills that educators set out to teach formally and which help children to develop are achieved naturally in the outdoor environment. As an extension of the classroom, the school grounds can be used in varied ways for formal and informal learning activities. All curriculum areas can be embedded into outdoor learning, although science related curriculum is what comes to mind first, it is an equally ideal springboard for learning in The Arts, Literacy and Language, Social Sciences and Physical Development. Pay attention to existing instructional uses of the site and work with staff to expand the experiential learning opportunities outdoors.

Forest Hill Public School

Durham District School Board

8. Respond to local ecology and community

Design outdoor spaces to suit the school's ecological setting, as well as the unique characteristics of the school community. Incorporate the local ecology into the design of outdoor play and learning spaces: include trees and shrubs found in local woodlands to make ecological connections and support habitat corridors; expand existing natural areas or features on the school ground; and understand the site's water and drainage patterns to make connections to the local watershed.

Include cultural connections through art and site elements; make connections to your school's mascot or learning goals through theme gardens, murals, art, sculpture, totems, signs, seating and gathering spaces.

9. Meet staff needs

Meeting the needs of staff in outdoor play and learning environments is essential to the success of the space. A diverse learning environment with many activity zones is different from a traditional playground with one or two dominating features, so talk with staff about their role in supporting a more natural and dynamic play environment. Consider the following suggestions:

- Provide easy-access storage areas for loose parts and props used in the play settings.
- Locate seating and work spaces in the shade.
- Provide outdoor shelter to allow extended instructional time outside and for children to experience changing seasons and weather conditions.
- Plan for several different vantage points for supervision.
- Provide water sources.
- Create flexible spaces that can be changed and modified by students and staff.
- Consider access to outdoor play and learning spaces in the winter months.

10. Plan for maintenance and sustainability

Keep maintenance and sustainability of elements in mind as you plan for a diversity of play and learning spaces.

- Provide maintenance staff with gates for equipment access.
- Think carefully about material choices. Be sure to choose a variety of materials with different life cycles such as wood vs stone.
- Pay attention to transitions between adjacent materials, such as having log edging next to the sand play area and a mulch trail, so materials do not migrate together.
- Remember that stewardship of a space can be part of program goals, as it helps children to learn about responsibility and to care for each other, their surroundings and the natural world. All grades can share in the maintenance and upkeep of the outdoor space. In fact, this is a wonderful opportunity for character building and developing a deep understanding of how and why things happen in the outdoors.
- Keep a log book of your design choices, rationale, and maintenance activities to help the next school committee to appreciate and care for the outdoor learning space.

Centennial Public School

Additional Considerations for Kindergarten and Primary Play Areas

1. Use a Child-Centred, Inquiry-Based Approach

Make design decisions with an understanding of children, children's play, and the importance of inquiry in learning and development.

David Sobel, a leader in the field of place-based education, has outlined seven categories that help to guide us back to our earliest experiences in nature and apply these experiences as we design children's spaces today: Adventure, Fantasy and Imagination, Animal Allies, Maps and Paths, Special Places, Small Worlds, and Hunting and Gathering.

Coronation Public School

Adventure

Physical challenge, anticipation, and mystery foster a sense of adventure. Anticipation implies that you don't fully know what's going to happen when you start out. It takes into consideration the importance of risk in the landscape. As a child grows, learning to negotiate risk contributes to a child's ability to make sound decisions. This is supported when children encounter risks and overcome fears on the playground (Sandseter 2011). Risk can be a catalyst for growth - it helps children develop good judgement, persistence, courage, resiliency, and self-confidence (Finch 2012).

Fantasy and Imagination

Children naturally engage in creative play. Support this innate behaviour by providing props and making spaces that allow children to act out their imaginary worlds. Provide hands-on interactions with living things such as insects, birds and plants. Build rich environments that facilitate story-telling and dramatic play. Set the stage for children to imagine themselves in many different roles.

Animal Allies

Interactions with animals help to connect children to the natural world. Facilitate the interaction between children and animals by providing opportunities in the landscape that support the observation and exploration of animals and their natural habitats. Children will notice the animals that they see and hear in their environment - a cardinal or a caterpillar can be the springboard for rich learning and investigation.

Maps and Paths

Children have an inborn desire to explore. They love to search out new places and find different ways to get to places. For this reason avoid designing every square inch of a play space; allow children to devise their own secret trails, short cuts, or informal paths.

Special Places

The latest research on self-regulation reminds us how important it is to allow children to have places in which they can find their balance again. Design a space that incorporates hiding places and fort building and provides children with loose parts to build their own dens, forts and huts. Furthermore, school is such a busy place, filled with so many adults and children. The outdoors offers a place for a quiet moment, a chance to take a breath and regroup before rejoining the larger group of students.

Small Worlds

Children role play real life situations through imagining scenarios and building small worlds. Plants, sand, soil, and snow, along with loose parts, are materials that children can relate to and manipulate for building and creating their own small worlds. Creativity is an essential habit of mind for today's children. They are required to bring their own original ideas to the topics that they are exploring in school.

Hunting and Gathering

Children experience rich learning, when given an opportunity to find, gather, and collect things. Holding treasure hunts, supplying loose parts, and enriching spaces with gardens and vegetation are great ways to satisfy this impulse. A space that offers a variety of natural materials, surfaces, and textures provides an environment where children can search for patterns in nature, as well as collect bugs, leaves, rocks and sticks.

The acts of hunting and gathering must however be accompanied with respect for the natural world, including the release of live specimens (bugs) back to their natural habitat, taking care not to destroy natural habitats, and not taking too many plant specimens from a habitat area.

Edna Staebler Public School

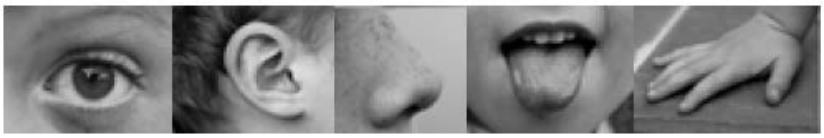
2. Include Loose Parts

Adding props to play settings should be encouraged, planned for, and budgeted. For instance, space and funds should be allocated for the purchase of turning stones in a nature study area, log rounds to roll and stack, garden and sand tools and watering devices, snow shovels and tools for collecting, moving and building with snow, bug nets and catchers, clipboards and field note materials, costumes and props, tarps and fabric for forts and imaginary play, found objects and natural materials (sticks, stones, pinecones, etc.) that can be used to construct and create. Go to Evergreen's Teacher's Corner for lesson plan ideas: http:/www.evergreen.ca/en/resources/schools/teachers/

3. Appeal to Children's Senses

Design outdoor environments that sharpen children's perceptual awareness and provide places for wonder, curiosity, and the expression of ideas. "Aesthetics" does not just refer to something that is beautiful to the eye, but anything that influences all of the senses - seeing, hearing, feeling, smelling, and tasting. For example, planting trees with leaves that rustle or tall grasses that sway in the wind around a seating area, planting a sensory garden, including colour and patterns through art and plantings, utilize the senses. These elements help children begin to name and notice what they see and hear in the natural world. Observing and identifying leads to asking questions, is the beginning of the scientific inquiry cycle.

Get a copy of Natural Curiosity: Building Children's Understanding of the World through Environmental Inquiry at http://www.naturalcuriosity.ca



SeeHear***Smell***Taste**Touch**

Chapter 2

Design Framework for Creating Outdoor Play and Learning Environments

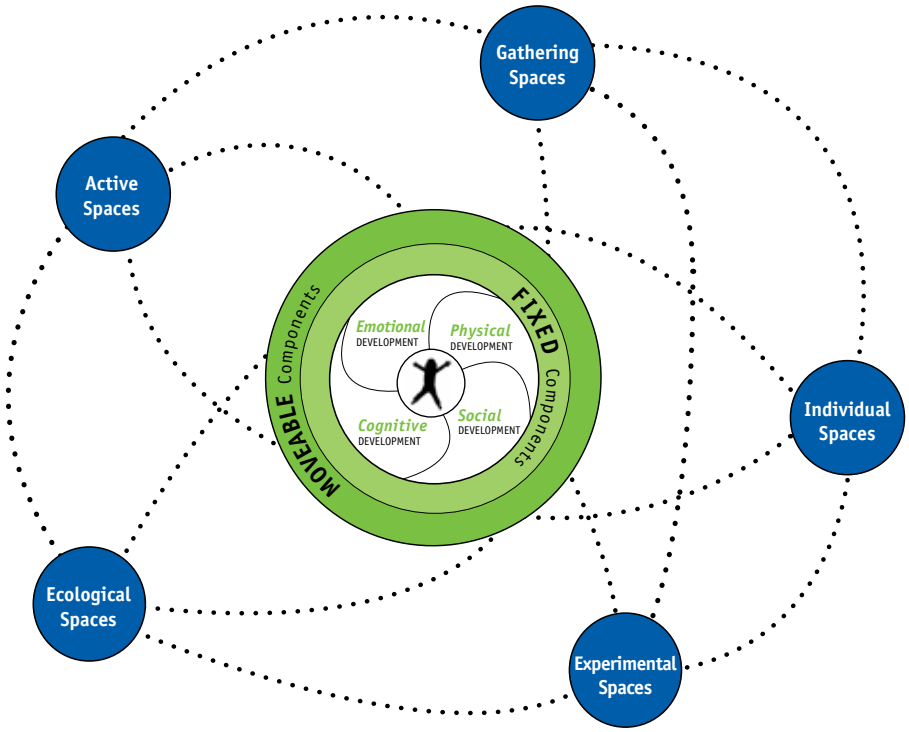
> **In order to act as an educator for the child, the environment has to be flexible, it must undergo frequent modifications by the children and the teachers in order to remain up-to-date and responsive to their needs to be protagonists in constructing their knowledge**

Carolyn Edwards, 'Education and Caring Spaces'

Design Framework for Creating Outdoor Play and Learning Environments

The Design Framework is a tool for focusing and organizing design thinking about outdoor learning environments. The Framework links student's developmental needs - physical, social, emotional and cognitive - to the choices and arrangement of the components of your design.

Central to the framework's utility is the understanding that the arrangement of the components of your design can be articulated through five key spaces, and that each of those distinct spaces is likely to have both fixed and movable components that serve a range of developmental needs. Although explored individually here, it is their relationship to each other that generates the greatest amount and variety of play and learning benefits across all ages and developmental domains.



Remember, there isn't one formula, or one perfect design; use this framework as a filter to create something that's unique to your school community - something that provides opportunities for students to connect directly with nature, through all ages.

Key Spaces

Active

Spaces should encourage active play and vary in topography, incorporate changes in height and physical fitness elements. These spaces feel energetic; they promote fitness and health and support physical and social development needs.

Individual

Individual spaces support quiet reflective moments, observation, and listening. This type of space would accommodate one or two students and could be on the edge of another play zone, most likely away from an active play area. This space is for private time, a place for respite, retreat, and refuge, away from loud noises. Individual spaces support cognitive and emotional development needs.

Gathering

Gathering spaces can be for a large or small group. These spaces foster social interaction. They offer seating and shade, and have a balance of soft and hard features. They accommodate multiple uses (outdoor classrooms, planned events) and users (children, staff, parents). They support physical, social, emotional, and cognitive development needs.

Experimental

Experimental spaces are flexible and temporary in nature. Experimental spaces promote discovery and exploration. Experimental spaces encourage creativity, constructing, building, testing, and idea-generating. Experimental spaces are filled with loose materials, and have seating and storage for educational materials such as hand lenses, clipboards, pencils, and cameras. These spaces support emotional, cognitive and social development needs.

Ecological

Ecological spaces attract birds, butterflies, and insects. Ecological spaces are a real-life demonstration of the cycles in waste, energy, and water. Ecological spaces inspire creative thinking, invite observation, and provoke inquiry. Ecological spaces evoke an emotional response, nurture a sense of responsibility, stimulate all the senses, and offer moments for reflection. These spaces support emotional, cognitive and social development needs.

Centennial Public School

Landscape Components

Fixed Components

Fixed components such as groves of trees, hills, rocks are the anchor points of the landscape paths that form the framework of your key spaces. Arrange these components to prioritize connectivity and maintain flexibility to support play, learning, and developmental needs. (See Table 1)

Moveable Components

The framework also includes a menu of moveable components that can be incorporated into the space to animate it. The list of moveable components is only restricted by your imagination. The possibilities are endless for what can be used to enhance play and learning in the outdoors.

The suggested components listed in Table 1 are not intended as a prescriptive formula for creating outdoor play and learning spaces; it isn't a matter of simply adding these ingredients. Rather, they can serve as a catalogue of ideas that illustrates the many possibilities for enhancing outdoor environments as rich terrains for learning and play.

Tait Street Public School

Developmental Needs

Physical Development

Early years spaces that incorporate paths, elevation changes, and physical challenges help develop motor skills, physical stamina and confidence while promoting fitness and health. Children in the early years need to climb, dig, roll, run, jump, leap, ride, hop, skip, balance, hang, grasp, cling, swing, lift, push, pull, slide, stretch, stack, carry, and pour.

Primary and junior play spaces that incorporate hills and berms, rocks and logs and different activity zones help to extend the complexity of movement at this age and support healthy risk-taking. Children in this age and stage need to climb, roll, run, jump, hop, skip, balance, and navigate their physical environment.

Spaces that incorporate trails, tracks, and fitness zones encourage and support physical activity for senior and adolescent students. Youth in this age and stage need to run, walk, exercise, and engage in activities that strengthen their muscle and bone.

Social Development

Through play, early years and primary-aged children learn rules, cooperation and sharing, and moral reasoning to develop values. Children develop a strong cultural identity and a sense of self and experience the consequences of their decisions through play. Children require outdoor play and learning spaces that support their need to share, engage in free play, walk and run together, play games, imagine, negotiate and problem-solve together.

Access to natural outdoor spaces helps to reduce anti-social behaviour in older children

Well-designed outdoor play and learning spaces support the physical, social, emotional and cognitive development of students across all ages and stages.

and youth, supports positive relationships, and helps to develop independence and their sense of autonomy. Outdoor spaces that have large and small gathering areas, destination points, gardens, and work stations provide areas for junior, senior and adolescent students to socialize, talk, share, laugh, hang-out, work, and problem-solve together.

Emotional Development

Through nature play, early years and primary-aged children are able to develop individual creativity, expression, and emotional connectedness. They learn empathy and responsibility, and develop a sensory awareness and stewardship ethic. Children in this age and stage need to have daily contact with nature; explore natural areas; tend a garden; dig for worms; find, collect and gather things; and experience the light, colour, and texture of vegetation changing with the seasons.

This early connection with nature continues throughout the later years of childhood and into adolescence as students continue to develop an emotional bond with nature, and start to take initiative to care for the environment. Access to natural outdoor learning spaces also helps students deal better with adversity and instills a sense of inner peace. Children and youth in this age and stage benefit from planting and caring for a tree; tending to a garden and giving back to the community, expanding their awareness and impact on the energy, water, and life cycles around them.

Cognitive Development

Natural outdoor play and learning spaces support the development of creativity, perceptual, and problem-solving skills in early and primary aged children. Children in this age and stage benefit from building, creating, doing, undoing, transporting, shaping and reshaping their environment; engaging in fantasy play; performing and role play; perching, spying, planning, hiding, and revealing; retreating and hiding, but at the same time seeing (between branches, from behind the tall grass); being quiet and observing the world around them; exploring, discovering, and reflecting.

Flexible and abstract-thinking, reasoning, and observational skills are supported through the junior, senior and adolescent years through contact with natural outdoor environments. Children and youth in these ages and stages benefit from being involved in decisions about their space; defining and evolving their environment; feeling ownership and benefiting from partnership; and making choices and seeing the possibilities.

Sandhills Public School

Table 1: Design Elements That Support Development Needs

P physical development **C** cognitive development **S** social development **E** emotional development

	GRADE LEVELS												
MOVEABLE COMPONENTS	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Paths (various materials)	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S
Bridges (wooden, rope)	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S
Rumble Strips	P C S	P C S	P C S	P C S	P C S	P C S	P C S						
Berms, hills, varying topography	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S
Mulch mounds	P C S	P C S	P C S	P C S	P C S	P C S	P C S						
Nature Trails	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S
Spaces with nooks, semi-private areas	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Nature study areas	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Groves of trees	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Rain, bird or butterfly gardens	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Storm water bio-swales	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Habitat gardens	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Vegetable gardens	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
No mow zones	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Water play	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Sand play	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Art boards/walls/murals/ activity stations	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E
Musical elements (chimes, drums, amandinda)	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Elements of varying heights for jumping	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Elements for sliding	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Climbing logs or poles	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Climbing walls	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Elements to crawl under, through or over	P C S	P C S	P C S	P C S	P C S	P C S	P C S						
Obstacle course	P C	P C	P C	P C	P C	P C	P C	P C	P C	P C	P C	P C	P C
Hanging bars	P	P	P	P	P	P	P	P	P	P	P	P	P
Balance ropes	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S
Rope pulls	P	P	P	P	P	P	P	P	P	P	P	P	P
Exercise tracks and equipment						P	P	P	P	P	P	P	P
Stages or decks	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E
Work tables	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E
Forts or tipis	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Boulders (seating, climbing)	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE	PCSE
Stepping stones	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Play posts	C S E	C S E	C S E	C S E	C S E	C S E	C S E						

Design Elements That Support Development Needs

P physical development **C** cognitive development **S** social development **E** emotional development

GRADE LEVELS

MOVEABLE COMPONENTS	K	1	2	3	4	5	6	7	8	9	10	11	12
Pulleys	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S				
Rock piles/turning stones	P C S	P C S	P C S	P C S									
Wood cookies	P C S	P C S	P C S	P C S									
Cedar (wood) boards	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S				
Stump stools	P C S	P C S	P C S	P C S									
Art boards/activity stations	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E
Water buckets, pails	P C S	P C S	P C S	P C S									
Fabric pieces and tarps	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Water walls	C S E	C S E	C S E	C S E									
Music elements	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Weaving walls	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Costume and props	C S E	C S E	C S E	C S E									
Clipboards, magnifying glasses, bug kits	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Child-sized tools (shovels, rakes brooms, paint)	P C S	P C S	P C S	P C S									
Tools (junior)					P C S	P C S	P C S						
Tools (senior/adolescent)								P C S	P C S	P C S	P C S	P C S	P C S
Building materials (cob, clay, rammed earth)	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S	P C S
Weather stations	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E	C S E				
Bird feeders, bat boxes and toad houses	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Bug hotels and trails	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Natural loose parts (seeds, leaves, pine cones, stones, sticks)	C S E	C S E	C S E	C S E	C S E	C S E	C S E						
Annuals (sunflowers, nasturtiums)	C S E	C S E	C S E	C S E	C S E	C S E	C S E						

Chapter 3

Outdoor Play and Learning Design Concepts

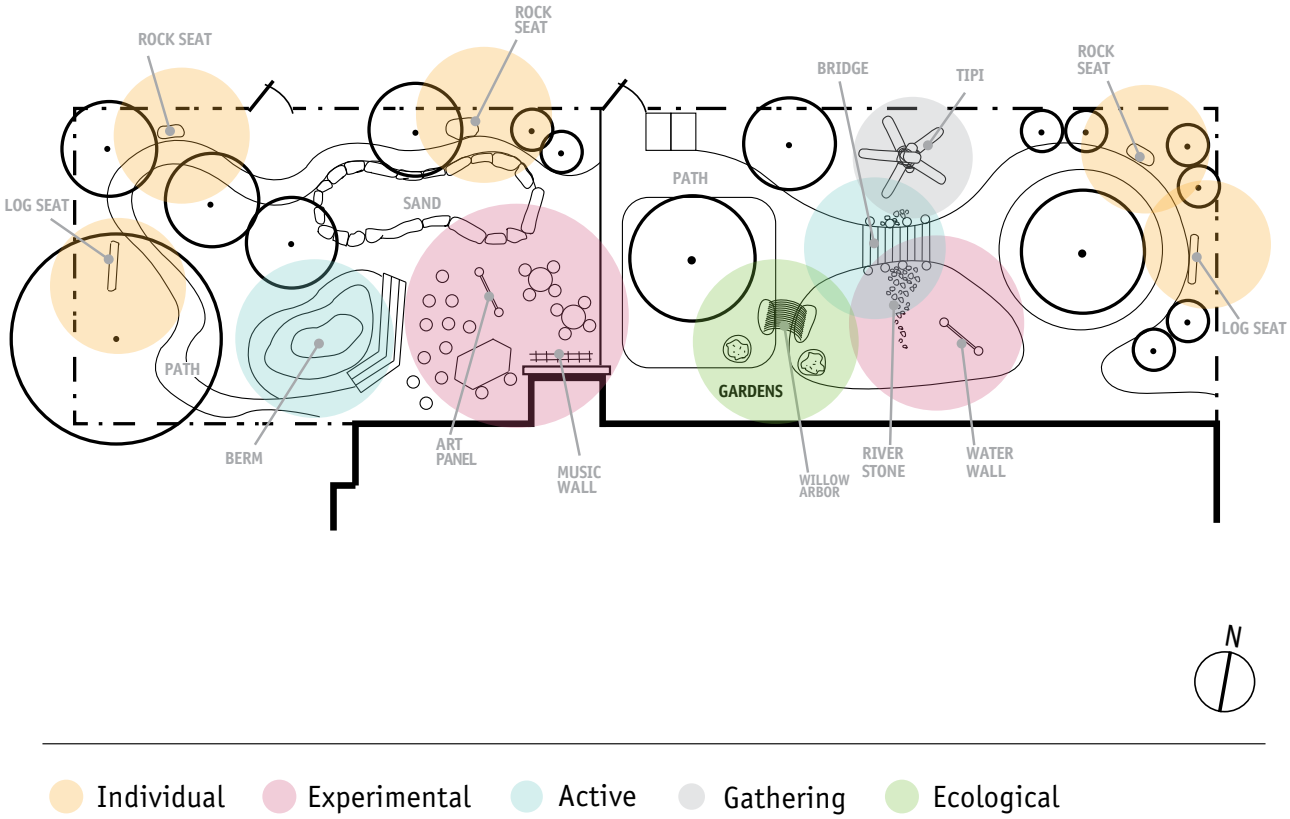
> **The play yards associated with (out-of-home care) settings could become a primary place where young children can gain experiences with nature. Careful landscape design, moreover, can address a fuller range of developmental goals and milestones than simple play equipment can.**

Susan Harrington and Kenneth Studtmann

Outdoor Play and Learning Design Concepts

The following conceptual designs and accompanying images exemplify the use of the design framework in creating vibrant outdoor learning spaces across all age ranges in the WRDSB.

FDK Play – Learning Environment



FDK Play – Case Study

willow tunnel

Rockway Public School

tipi and bridge

Rockway Public School

sand

Rockway Public School

water wall and bridge

Rockway Public School

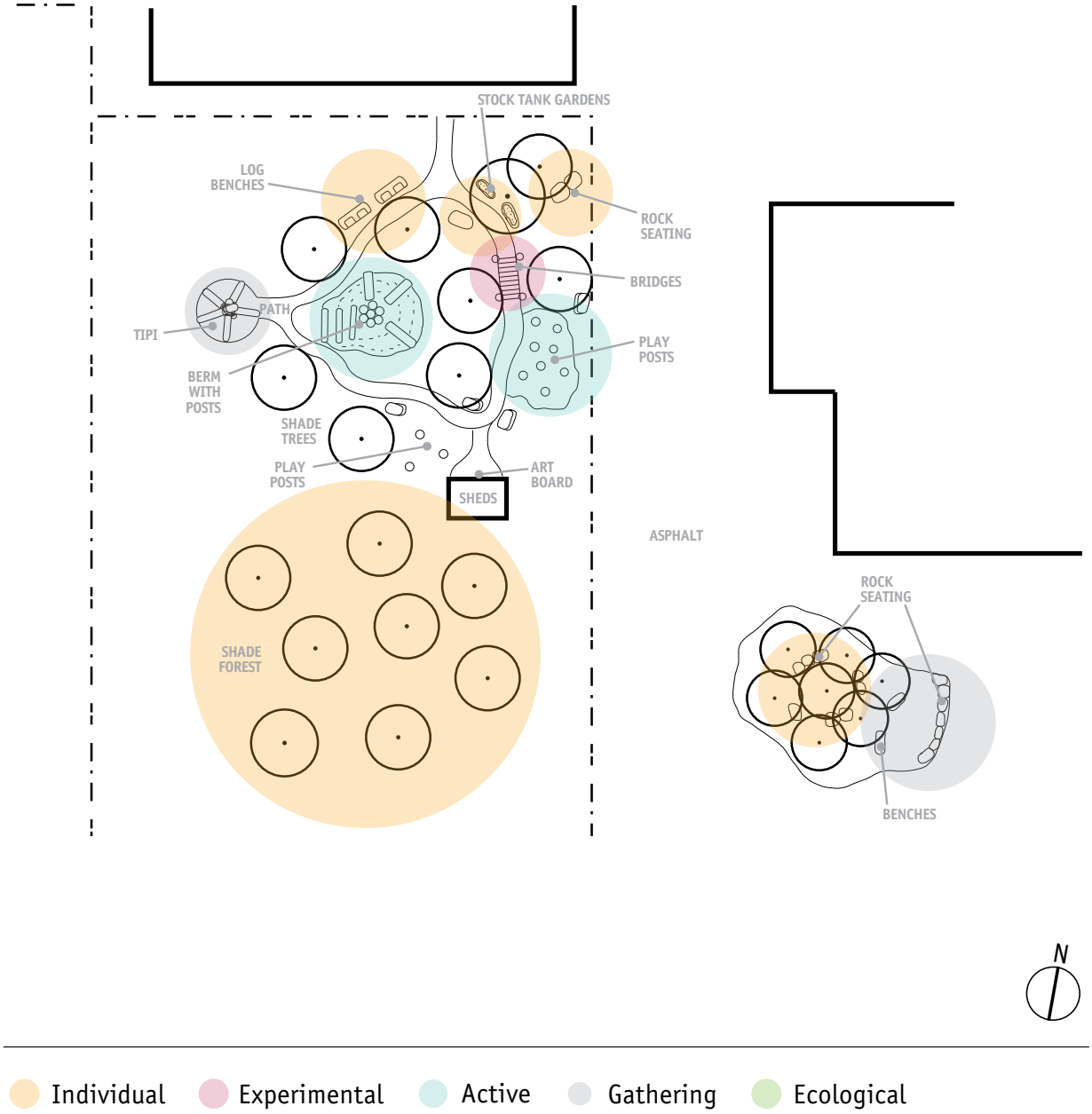
berm

Rockway Public School

ampitheatre seating

Rockway Public School

Primary & Junior (1-6) Play – Learning Environment



Individual Experimental Active Gathering Ecological

Primary & Junior (1-6) Play – Case Study

bridge

Forest Hill Public School

play posts

Forest Hill Public School

berm with post

Forest Hill Public School

log benches

Forest Hill Public School

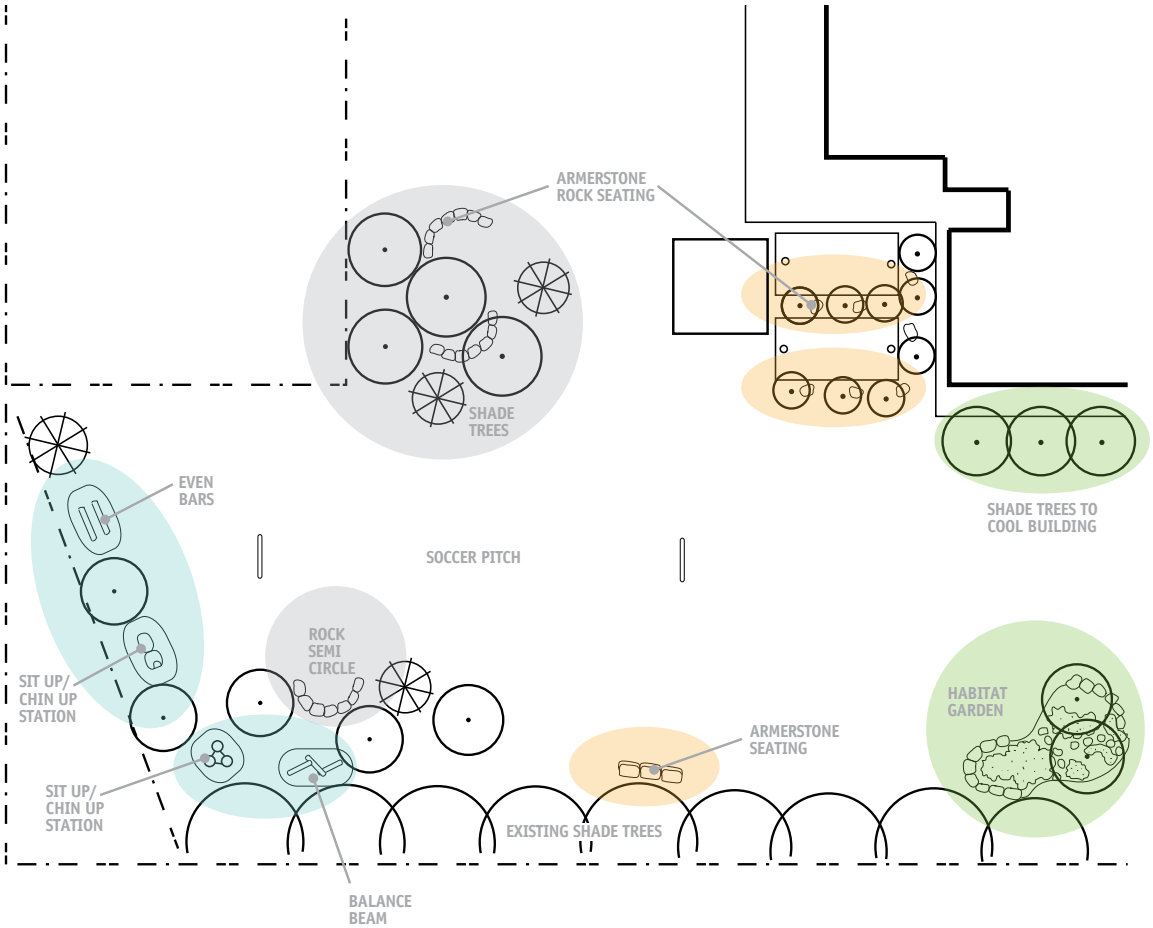
path

Forest Hill Public School

rock seating

Forest Hill Public School

Intermediate (7-8) Play – Learning Environment



Individual Experimental Active Gathering Ecological

Intermediate (7-8) Play – Case Study

rock seating

Stewart Avenue Public School

exercise station

Stewart Avenue Public School

rock seating

Stewart Avenue Public School

exercise station

Stewart Avenue Public School

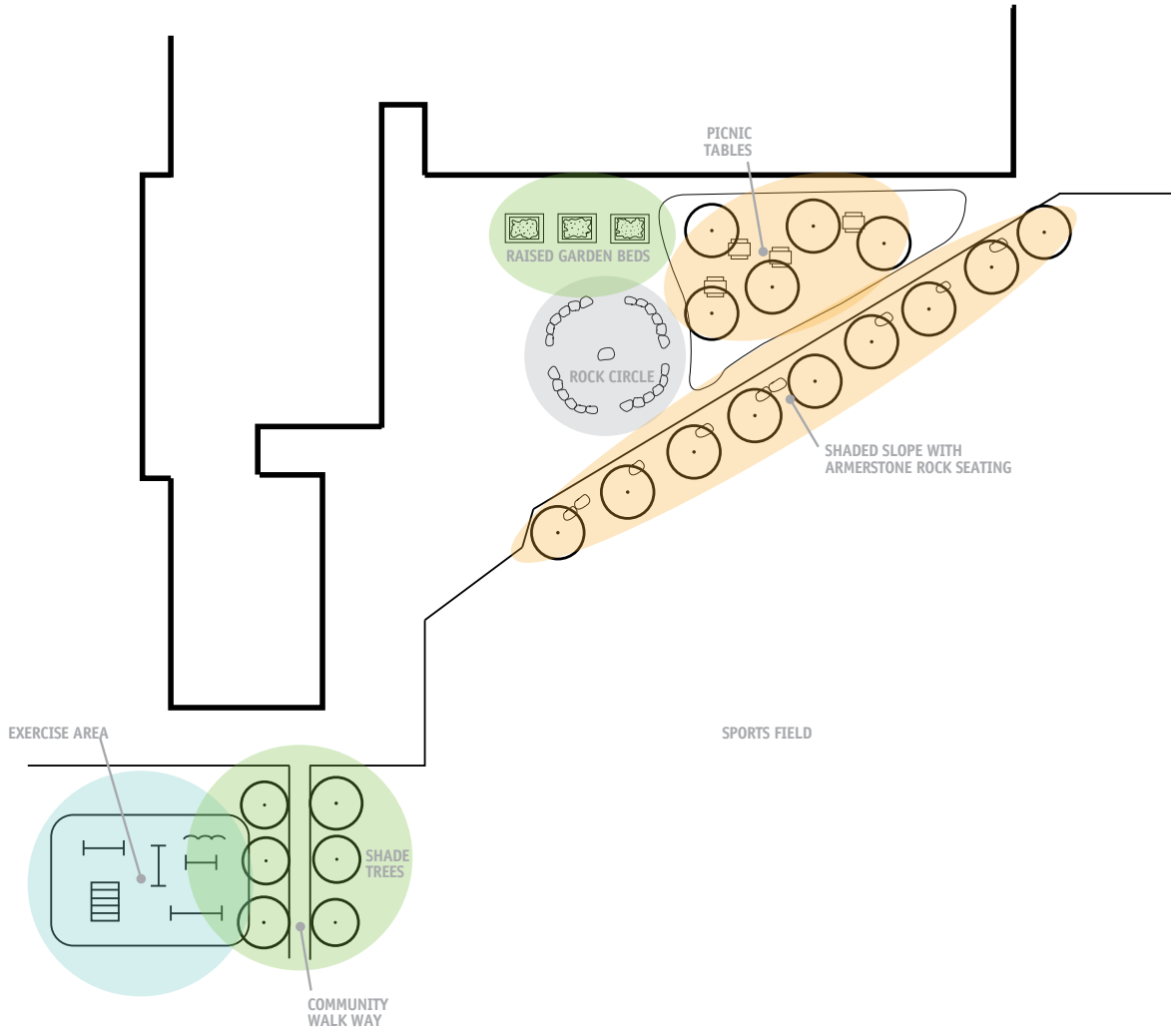
rock semi-circle

Stewart Avenue Public School

exercise station

Stewart Avenue Public School

Senior (9-12) Play – Learning Environment



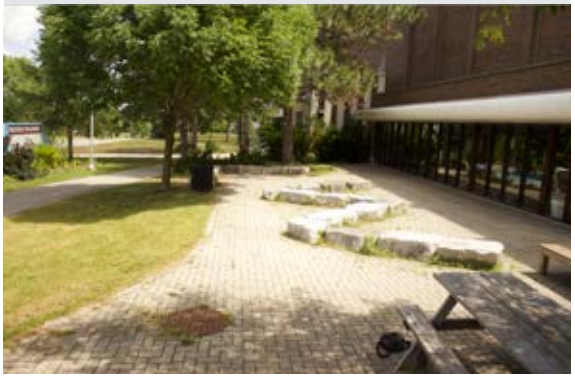
Individual Experimental Active Gathering Ecological

Senior (9-12) Play – Case Study

rock seating

Bluevale Collegiate Institute

zig-zag seating



Bluevale Collegiate Institute

rock planters

Bluevale Collegiate Institute

exercise station

Bluevale Collegiate Institute

rock seating

Bluevale Collegiate Institute

exercise station

Bluevale Collegiate Institute

Chapter 4

Building Outdoor Play and Learning Environments

> **An aim of site design is to locate and juxtapose settings in such a way that the greatest variety of play activity patterns will be generated, producing the greatest possible range of interactions and relationships while meeting the requirements of different ages, abilities, and developmental stages.**

Moore and Goltsman, 'Play for All Guidelines'

CHAPTER 4

Building Outdoor Play and Learning Environments

Building successful outdoor play and learning landscapes means using guidelines and construction details based on "best practices" that have been purposefully developed for school grounds.

It also means working with the WRDSB to take into consideration the integrity of the school building, future needs (e.g. expansions, portables) and operational needs. The school grounds and any work that is completed on the grounds is property of the WRDSB. Therefore, any outdoor play and learning projects must work in concert with the overall site goals, current, and future needs.

The section that follows provides principles, guidelines, planning and construction details to school committees (parents, teachers, administrators, design consultants) in planning and installing exemplary outdoor play and learning environments at schools.

The Big Picture

Best practices for designing natural play and learning spaces on school grounds takes into consideration:

- Designing with the existing ecological features.
- Treating water as a resource, not as waste.
- Protecting existing trees and expanding the urban forest.
- Planning for sustainability.
- Creating a balance of hard and soft surface areas.
- Designing for accessibility.

Design with the Existing Site's Ecological Features in Mind

Let the natural features of your site guide your decisions. If an area is naturally moist, don't fight this; plant moisture-loving species or create a dry river bed. Let the soil structure dictate what tree and shrub species should be planted where.

Treat Water as a Resource, Not as Waste

Link each school property to its watershed. Positive action at the site level benefits the whole watershed. The goals are to reduce the quantity and to improve the quality of stormwater runoff through infiltration at the site, rather than sending it to the storm sewer. Where practical, consider alternatives to impervious hard-surface asphalt in play areas, or direct run-off to transition zones of trees and mulch situated between hard and soft surfaces.

Protect Existing Trees and Expand the Urban Forest

Take every measure to protect existing natural areas, and healthy, mature trees and native shrubs on site.

When installing new outdoor play and learning areas/elements ensure that within the drip-line (the outermost reach of the branches) of existing trees there is no root cutting; changes to the grade by adding fill, excavating or scraping; soil compaction; storage or stockpiling of construction materials, equipment, soil, debris or waste; or movement of heavy vehicles or equipment.

Plan for Sustainability

Plan for long-term use and sustainability of outdoor learning spaces. Use sturdy and resilient materials to withstand weather conditions, constant and long-term use on school grounds. Consider the care and maintenance of the site over the next 10, 15 and 20 years. How will the materials and elements be maintained? How durable are they? How long will they last? Will they stand up to vandalism? What will be the cost to maintain and or replace elements?

Use sustainably sourced construction materials when possible, and plan for flexibility in future site use. Avoid sending useful materials to the landfill. These actions have multiple benefits; reducing the energy required to extract, process, and transport resources, as well as reducing the impact and avoidable costs of waste disposal. Any time we reduce energy use by reusing materials on site, we produce fewer greenhouse gases.

Create a Balance of Hard and Soft Surface Areas

Strike a balance between hard and soft surfaces in the design of the outdoor play and learning environment. A varied palette of surface materials in the play space can be a strong stimulant for physical, cognitive and social development. Consider the use of berms and elevation changes, along with path and surface materials.

Design for Accessibility

Natural play and learning spaces need to meet the needs and range of abilities of the whole school and community.

Natural play and learning spaces create an opportunity to provide for meaningful and diverse experiences for all users. Accessible play and learning spaces are inclusive spaces. Use a thoughtful layout for the play and learning components to foster interaction and socialization among all users (students, parents, care-providers, community members), not just provide accessible components in one section of the play space. Consider elements for a range of abilities, including:

- Physical (e.g. mobility equipment).
- Sensory (e.g. visual, hearing).
- Developmental (e.g. autism).

As well, consider accessibility to different components as a play opportunity in itself. For instance, pathways, ramps, bridges, and joining elements are also part of the play experience, and can provide for the developmental needs of children with all abilities.

All play spaces must comply with three key pieces of legislation:

- CAN/CSA -Z614-14 Children's Playspaces and Equipment (CAN/CSA-Z614-14) and the appended accessibility guideline, Annex H (informative) Children's playspaces and equipment that are accessible to persons with disabilities.
- The Accessibility for Ontarions with Disabilities Act 2005 (AODA), together with the accompanying Ontario Regulation 191/11 'Integrated Accessibility Standards' and 'Accessible Built Environment Standard, 2010'.
- Ontario Regulation 368/13 - Amendment to Building Code Accessibility Requirements.

The legislation applies to new play and learning spaces, as well as renovations and retrofits to existing playgrounds. The key considerations for accessible design are to:

- Ensure users can get to each element (e.g. provide a stable surface, provide visual cues).
- Ensure elements can be used by school and community members with varying physical and sensory abilities.
- Provide "like" opportunities for varying abilities (e.g. multiple access points to a sand play area; a rumble strip path alongside a step log climber path).
- Remove barriers (e.g. curb edging, walls).
- Provide supports (e.g. transfer stations, railings).
- Increase opportunities and create a range of challenges so users can choose their own experience.

The WRDSB strives to exceed all guidelines where possible to provide increased play and learning opportunities for all abilities.

Coronation Public School

Creating Shade

It is the policy of the WRDSB to promote public health through the development of a culture of sun safety through education, communication, and action (See Board Policy 2011 - Sun Safety and Shading - http://www.wrdsb.ca/wp-content/uploads/CombinedP2011Sun-Safety-Shading.pdf).

The Board recognizes that the providing of shade reduces the heat island effect by reducing the temperature of hard surfaces including paved areas and parking lots; and enables children and youth to play in outdoor environments while providing protection from the harmful impact of ultra-violet radiation (UVR).

Consider planting shade trees where people congregate—for example, around playground equipment, benches and tables; in or next to hard-surface play areas; and along sports fields.

Guiding Principles

- Make shade for play spaces a priority—look to extend existing shade with careful placement of trees.
- Ensure that new shade initiatives do not intensify winter conditions at the site. Winter shade provision should minimize UVR levels while allowing for transmission of sufficient levels of heat and light. Summer shade provision should minimize UVR exposure as well as reduce heat and light.
- Strive to achieve canopy coverage of key play areas on the school property at maturity, and coverage of all hard surface areas.
- Decrease the demand for fossil fuels by shading buildings to reduce air conditioning use. Be cognizant of security and building envelope concerns when selecting and planting tree species (i.e. do not plant trees too close to buildings).

Natural Shade

Introduce shade using trees rather than shade structures or gazebos. Trees are a long-term investment: they generally improve and enlarge as they age (rather than deteriorate), are less expensive at the outset, and provide many environmental benefits.

Forest Glen Public School

Create Groves of Trees

Plan for groves of a variety of deciduous tree species to create natural gazebos for shade and cooling.

Shade needs to be where children play and gather rather than lining the far edges of the school grounds or property line. Ensure that trees are located where children and community members spend most of their time:

- Active play areas (asphalt areas, high-traffic areas, near play structures).
- Meet-and-greet areas (drop-off and pick-up locations).
- Small and large seating areas (benches, outdoor classrooms, and theatres).

Use deciduous trees on the southeast, south, and southwest sides of the play spaces to shade children during the hottest parts of the day or when the sun's UVR are strongest, and to reduce the reflectivity of paved surfaces and building walls.

Consider planting a variety of sizes of trees to maximize immediate and long term shade needs, as well as stagger life cycle replacement needs.

Built Shade

Shade structures can be used for multiple functions, such as outdoor classrooms, social gatherings, and areas for eating, reading and writing, or quiet reflection.

Permanent Shade Structures

Examples of permanent structures include pergolas, trellises, arbours, and shade sails. These types of projects are not generally part of the play and learning project team's work, but are capital projects that may be undertaken with the support and direction of WRDSB staff. For instance, shade sails or structures may be used in courtyard outdoor classroom areas where the space requirements for trees are limited, and vandalism is decreased.

Temporary or Portable Shade

Portable shade is provided by temporary shade sails, tarps, shade tents and umbrellas. It can be moved and relocated as needed.

Consider the following points in your planning:

- Use play elements such as play posts to provide a structure for the temporary tarps and sails, but that also provide play opportunities.
- Consider where natural, built, and temporary shade can be used in combination to provide maximum UVR protection.
- Consider vandalism and ensure long term sustainability by planning for storage and protection of temporary shade features.

Designing with Trees and Shrubs

A tree-planting strategy and design should be an integral part of every school's vision for their natural play and learning space.

Guiding Principles

- Consider shade and cooling when choosing locations for trees.
- Protect and increase biodiversity.
- Choose native species of trees (See Appendix E: Recommended Plant List).
- Provide optimum growing conditions to support long-term plant survival and growth.
- Ensure that there is a reliable source of water for tree care.
- Choose good nursery stock; planting healthy and structurally stable trees is a primary goal.

Ecological, Economic, and Health Benefits of Designing with Trees and Shrubs

Trees and shrubs provide a number of ecological, economic, and health benefits. For example, they:

- Provide shade from summer sun and shelter from harsh winter wind.
- Absorb water and replenish the water table.
- Reduce stormwater runoff.
- Prevent soil erosion.
- Reduce the amount of time, energy, water, fertilizers, and pesticides required to maintain ornamental plants in the urban environment.
- Provide wildlife habitat.

Tree and Shrub Placement

The right location of trees and shrubs is essential to their survival and long-term health. When planning tree and shrub placement:

- Do not plant trees or shrubs within fire or service access routes or snow clearing and storage areas.
- Avoid planting trees too close to the building envelope, in areas of potential building expansion, portable installation (including portable move-in and move-out routes) or parking lot expansion.
- Be sure to check that there is a source of water nearby. If possible, create a source of water for tree management (repair existing hose bibs; install new hose bibs; design the building with external roof leaders and cisterns or rain barrels; and direct surface runoff toward planting areas).
- Do not plant trees on berms to avoid possible erosion, compaction, and exposed roots.
- Incorporate shrubs into beds to make them easier to care for and to improve their chances of survival.

Forest Hill Public School

Tree-Planting Distances from Built Objects

The following standards help ensure student safety, maintenance and emergency access, and healthy growing conditions for your tree and shrub plantings. All distances are measured as a radius and are expressed as minimum distances.

- 2m from a bench, seating stone or rock
- 2m from an interior fence
- 7m from a fence of an adjacent residential perimeter neighbour
- 2m from asphalt areas and walkways
- 5m to 7m from other trees (or appropriate to the selected species)
- 7m from a building
- 7m from a running track (no trees planted inside track area)
- 6m from soccer and football boundary lines
- 4m from the toe of a berm
- 6m from a fire hydrant
- 10m from a flag pole
- 3m from underground utilities
- 3m from above ground utilities

Maintaining Visibility

- Avoid blocking night lighting or interfering with security cameras.
- Taller shrubs, such as Alternate Leaf Dogwood, Serviceberry, and Nannyberry naturally grow in a vase shape and are ideal choices when sightlines need to be accommodated.
- Contemplate and be considerate of supervision requirements.

Avoiding Salt Damage

Anticipate areas that will be subject to salt runoff and, if possible, avoid them. Follow these guideline when it is necessary to plant in these areas:

- Check to see if paved play surfaces are plowed in winter and if salt is used to keep them clear.
- Avoid planting trees in areas subject to salt runoff - locate planting islands on the up hill side of salted areas, or plant trees in large raised planters.
- Plant in a large box planter using small varieties such as serviceberry or dogwoo shrubs. (For more information on salt-tolerant trees and shrubs, refer to Evergreen's Native Plant Database at http://native-plants.evergreen.ca).

Tree and Shrub Selection

Consider a number of factors when choosing trees and shrubs for the school ground. The following principles will help to ensure that the unique characteristics and features of your region and school ground are central to the plant-selection process.

Guiding Principles

Consider the following as you plan your selection of tree/shrub species:

- Sun/shade requirements.
- Size of the planting space and proximity to overhead obstructions.
- Wood strength (vandalism).
- Soil needs (including type, porosity, characteristics, pH, and compaction).
- Water requirements (drought tolerance and ability to tolerate poor drainage).
- Salt tolerance.
- Leaf size (e.g. small leaves are best in courtyards).
- Using species that lack thorns, berries (unless edible), or other fruit and nuts to reduce debris, the potential for throwing of the objects, toxicity, and allergies.
- Avoiding species that are low-pollinating, poisonous or a "noxious weed" (See the Ontario Ministry of Agriculture, Food and Rural Affairs list of noxious weeds in Ontario at: http://www.omafra.gov.on.ca english/crops/facts/noxious_weeds.htm).
- Design for diversity and avoidance of monoculture plantings.
- Avoid shrubs whose tops need to be pruned and clipped regularly, as this adds a maintenance burden. (See Appendix E: Recommended Plant List for Waterloo Region; Appendix B: Criteria for Acceptable Nursery Stock; and the Native Plant Database at http://www.evergreen.ca for associated plant lists).

Tree and Shrub Sizes

Minimum size requirements should be met to protect against vandalism and to ensure the survival of the trees and shrubs and success of the project.

Williamsburg Public School

Deciduous Trees

- Trees should be a minimum of 50mm in remote parts of the school ground where vandalism is not a concern, and 80mm caliper in high activity and/or vandalism-prone areas.
- Smaller trees, whips, and seedlings may be considered for Nature Study Areas where mowing is carefully managed and students can do the planting.

Coniferous Trees

- Trees should be 2.5-3m tall, depending on their susceptibility to vandalism or proximity to high-activity areas.

Shrubs

- Deciduous tall shrub, planted as singles or in groves should be a 2000-2500mm
- Deciduous small shrub, planted in a protected area should be 600mm

Coniferous shrub, planted in a protected area should be 600mm (See Figure 1.04)

Native Species

Native species are recommended on school grounds for a number of reasons. These include:

- Planting native species of trees and shrubs can replace natural communities that have been destroyed in urban centres.
- Native species have adapted to local soil and climate conditions, and once they are established will not require watering, chemical fertilizers, or pesticides in order to thrive.
- These species have evolved with local bird, mammal, butterfly, and insect populations and therefore provide essential food and habitat.
- Growing native species improves biodiversity and creates a local seed source.
- Planting native species and connecting existing green spaces provides migration corridors for urban wildlife.
- Native plants can provide an educational resource on school grounds.

Non-native Species

When non-native species must be used, consider the following suggestions:

- Place non-native plants in a separate garden from native species.
- Use columnar or dwarf cultivars of non-invasive species in areas around buildings or access routes.
- Use cultivars of native species that have been selected for hardiness and disease resistance, e.g. Emerald Ash borer (EAB).

What is a non-invasive species?

A non-invasive species is one that will not spread abundantly into local natural areas and compete with native species for space, water and light.

Refer to the Native Plant Database at http://nativeplants.evergreen.ca/ for a comprehensive list of native species.

Installation and Protection of Trees

Like proper placement, the proper installation of trees in school grounds is essential to their long-term health and survival. Following these recommendations will help to ensure a successful tree planting project.

Guiding Principles

- Build all pathways with accessibility for all users in mind.
- Provide a minimum 3 square-metre opening and 300mm of quality soil for a single tree planted in a hard surface area. For trees planted in groups of two or more in a hard surface area, provide a minimum of 150mm of high-quality soil per tree. Ensure that the granular base and rubble is removed with the asphalt.
- Be sure to remove all nursery tags and canopy ties before placing the tree in the planting hole.
- Be sure to protect the trunk from damage when using a backhoe and chain to lower the tree into the hole.
- Install protective caging (See Figures 1.01 and 1.03 T-Bar; Figure 1.02 Wood).

Protecting Newly Planted Trees

Trees (and the tree trunk) can be protected in the following ways.

- Planting trees into planting beds of mulch will protect roots and bark from traffic and lawn maintenance equipment.
- Install protective tree caging to protect trees from compaction and damage. (See Figure 1.02)
- Use rodent guards for smaller trees (below 60mm) in no mow areas.
- Do not use wires and hoses around the tree trunks.

Watering Newly Planted Trees

Newly planted trees will need summer watering for approximately three years. From May to August, each tree needs 136 litres (30 gallons) of water every week. From September to mid-October, each tree needs 136 litres (30 gallons) of water every two weeks. For a school-based watering strategy (See Appendix A: Watering Guidelines for Newly Planted Trees).

Sand Hills Public School

Steps to Follow:

- Ensure that hose bibs are accessible or that other water sources are available prior to planting.
- After planting, soak the root ball of newly planted trees and the distributed soils around the root ball with 227 litres (50 gallons) of water.
- Establish watering schedules with the school community prior to planting and appoint a School Tree Advocate as detailed in Chapter 5.

Mulch and Composted Amendments for Trees

Mulching has many benefits: it keeps roots cool, retains moisture, protects roots from foot traffic, reduces erosion and soil compaction, prevents runoff, reduces weeds and improves the organic content of the soil (See Appendix C: The Importance of Mulch).

- When possible, reuse soil from the site for plantings. Soils can be amended with mushroom compost and sand. If extra soil is required, it must also be sourced locally. It should contain no manure, herbicides, pesticides, or peat moss.
- Obtain mulch supplies from virgin bark and wood sources.
- Shredded pine mulch is preferable to wood-chips, since it has been ground down into a fine fibrous material that binds together.
- Do not use mulch that has been made from pressure-treated wood.
- Apply approximately 3 wheelbarrow-loads per new tree to a depth of 15mm. Spread mulch in a doughnut shape around the trunk out to the drip line.

Forest Hill Public School

Pathways

Pathways help to separate areas in the play space that serve different functions. They also provide a boundary to areas that should not be entered, and can be designed to function as features for informal play. Good circulation in a space can be a core catalyst for creativity. Pathways are essential in planning not only a highly functional space, but also one that inspires spontaneous acts of play. Wide paths can be play spaces in and of themselves. Smaller trails can provide private moments or facilitate a game of hide and seek.
Paths, tracks, and trails diversify the play environment by allowing students to move between and through elements, helping them to orient themselves in space.

The WRDSB recommends the following criteria for designing pathways in school grounds:

- Build all pathways with accessibility for all users in mind.
- Provide a variety of path choices to enhance variations for play and exploration.
- Plan for pathways that lead to, intersect, or run adjacent to play settings.
- Include seating, accessible play features, and pull-off points along the path to rest, read signs, or play.
- Create designated paths for cart pulling.
- Design pathways in the form of intersecting circles to allow for continuous movement—avoid dead-end paths.
- Consider small changes in elevation, bridges, and rumble strips to increase interest and support gross motor development.

Guidelines for Pathway Surface Materials

Pathway materials should be chosen with accessibility in mind. Materials should be non-slip asphalt, concrete, limestone screenings, or crushed brick.

Shredded pine mulch provides easy mobility on nature trails or garden paths. For wheelchair access the mulch needs to be American Society for Testing and Materials (ASTM) compliant, e.g. Annex H of the Canadian standards Association's Standard for Play Spaces. (See http://www.astm.org/Standards/D6322.htm to download a copy of the standards).

Types of Pathways

Pathways provide accessibility and help to separate spaces that serve different functions. The following types of pathways and the suggested materials provide a variety of options that are practical and sustainable.

Bridges

Connecting spaces with bridges or tunnels provides variation and enhances the visual interest of the play space (See Figure 2.03).

Garden Paths

Use limestone screenings, shredded pine mulch, or mown grass for perimeter garden paths, as well as between container and vegetable gardens.

Use log rounds, bricks, or stepping stones for informal paths through garden areas.

Nature Trails

Nature trails can support a number of activities, with pull-out spots for reading, group gatherings, and nature study, allowing students to explore a larger area of the school ground without interfering with active play zones. Trails can also be used for winter activities such as snowshoeing and cross-country skiing. Use mulch or mown paths that will not require heavy labour to install, possibly disrupting the ecology of the site. To provide a firm walking surface lay down 100–150mm of shredded pine mulch.

For wheelchair accessibility, or if ticks are a concern, use limestone screenings (See Figure 2.02).

Standard Dimensions for Accessible Paths

- Minimum width of 1500mm.
- Maximum slope of 5% (1:20), although 1–2% is ideal.
- Surfacing must be firm, stable, and slip resistant (e.g. asphalt, limestone screenings).
- Minimum clear ceiling height of 2100mm must be kept along the entire length and width of the path or provide cane detectable barrier around object obstructing head room clearance.
- Rest areas beyond 9mm length are required when slopes exceed 1:20 and additional width is required as per the Ontario Building Code.

Seating

Seating provides an opportunity for a time out, a place to reflect or to socialize. Choose seating from diverse materials—anything from sculpted logs, stumps or rocks to store-bought benches or even a cement mosaic in the shape of an animal.

Amphitheatre seating can also be created formally using hand-made wood benches or mini-bleachers or with natural materials such as armour stone or limestone rock terraced into a slope. Look for opportunities to use the existing grading for informal seating, such as grassy slopes and low retaining walls. Incorporate different levels of seating if possible and provide a natural place for an instructor to sit or stand in clear view of all seats.

Guiding Principles for Seating

- Observe students at play to determine where students currently gather and what activities take place in those areas to match the seating with the use in that area.
- Interview staff to understand what their needs are with respect to teaching outdoors.
- Make sure the seating is accessible to all students; leave space near fixed seating for wheelchairs and other portable seating.
- Allow for seating in a variety of sizes, shapes, and arrangements, based on project goals and the different ages of the students.
- Consider opportunities for incorporating seating with existing or new built features, such as container gardens, raised beds, steps, retaining walls, or trees (tree seating rings).

Suddaby Public School

- Supply some form of movable seating such as logs or stumps that will allow students to create their own arrangements.
- Construct seating to stand up to the weather.

Types of Seating

Seating that is either permanent or moveable is essential in an outdoor environment. Stone, wood, and logs are the most popular materials used for seating in these spaces. This section outlines a number of considerations with respect to design, sustainability and scale to help you determine the best solutions for a particular site and its users.

Wood Benches

In some locations, wood benches may be preferred to seating stones, such as outdoor work and eating areas for older students, pick up and drop off zones, formal teaching areas, and around trees in high traffic areas. Here are some considerations for wood benches.

- Choose natural materials instead of synthetic materials wherever possible for ready-made benches.
- Consider safety and how to minimize vandalism in your design.

- Do not construct with wood that has been treated with chemicals.
- Square wood and metal frame benches placed around trees help to protect new and existing trees and provide a shady spot for socializing, play, and learning.

Stones

Flat-topped, block-shaped rocks provide a long-term seating solution. Rounded boulders are not easy to use as seats or tables and their sloped sides tend to be slippery, especially when wet or covered with frost or ice.

Limestone boulders are generally the best seating stones as they are layered, angular, block shaped, and often contain fossils and crystals that support cognitive development.

The following are guidelines for placement:

- Place with tops level so they are comfortable as seats and can be used as tables.
- Place either tight together or minimum 1.8m apart to discourage jumping from rock to rock.
- Optimum "seat-to-feet" height range, related to the top of the mulch is 275-325mm for Kindergarten or 325-400mm for primary and 400-500mm for junior play areas (See Figure 3.02, Armour Stone Seating – Single Boulders - Kindergarten).
- Provide a surface such as 150mm of mulch around the base of all seating stones for a minimum 900mm distance.
- Be sure to remove any sharp edges—bush hammer, chisel, or grind down the edges of the stone to a 6mm radius (See Figure 3.02).
- Paint a checkerboard pattern on rocks to create a play and seating space.

Forest Hill Public School

Logs

Logs are versatile, however, there are some things you should be aware of when using logs:

- Do not use logs from old or sick trees that have been felled. These logs attract wasps, rot quickly, and can spread disease to other trees on the school ground.
- Logs should be solid hardwood and peeled. An exception to this would be in a naturalized informal area where the bark left on logs offers more opportunities for scientific inquiry.
- Optimum "seat-to-feet" height range, related to the top of the mulch is 275–325mm (as with stones)
- Logs can be sculpted and sealed to protect their longevity.
- Logs should be leveled on two sides or set in the ground to prevent rolling.
- Place logs on a bed of gravel to eliminate contact with the soil which could accelerate rot. (See Figure 3.05)
- Fasten or trench any large logs that could pose a risk to student safety.

- Log sections can be used as upright stump stools. These are moveable and versatile log seats.
- Logs may need to be replaced after 10 years due to weathering.

Suddaby Public School

Classroom-size Seating Areas

The purpose of providing a class-size seating area is to create a space for an entire class to gather outside at the start and end of an activity or for music, art, or drama classes. We recommend following these criteria when designing your outdoor classroom seating area:

- Provide protection from sun, wind, and rain by planting trees, installing awnings, or building shade structures over the seating area.
- Provide enough space to accommodate the maximum number of students who might be involved in outdoor classes.
- Provide enough open space for instructors to display items and for students to make presentations or engage in passive creative play.
- Locate class seating away from noisy streets and close to the school building for ease of transporting teaching and creative tools and equipment.
- Orient classroom seating areas so students are not looking into the sun.

For an example of amphitheatre style seating (See Figure 3.04 Armour Stone Seating - Tiered - Kindergarten).

Stanley Park Public School

Hills, Berms and Mulch Play Areas

Variation in topography becomes an important play feature in a typically flat school yard. Children are attracted to hills for winter sledding and in fall, spring and summer for climbing, rolling and viewing the school yard. Where not already existing, it may be possible to shape hills and berms and other ground configurations.

If berms and hills are being considered, keep the following in mind for a successful outcome:

- Generally a good height for winter sliding and summer climbing up and rolling down is 0.9-1.2m. The higher hill, the more room is needed to maintain a safe slope and stopping distance.
- Mulch has proven more effective as a surface covering than grass. A grass surface is very difficult to maintain on a well-used berm unless regular sod replacement is within the school's budget, and the berm is taken out of play for extended periods of time. On wet days, the berm can be off limits for play to prevent the top of the hill from turning to mud.
- Consider the effects that a berm could have on drainage. A berm with a flattened top at least 4m wide helps increase the absorption of stormwater runoff. It slows the flow of water down the sides of the berm which not only increases absorption, but helps reduce pooling at the toe of the berm.
- Grading at the base of the berm needs to be level with adjacent grades; avoid creating a depression at the base of the berm which would collect water.
- Grading at the toe of the berm must be shallow to prevent mower decks from cutting into the sides of the berm.
- The fill for berms must be free of any rubble that heaves to the surface with frost.

Rockway Public School

- Planting trees or shrubs on the top of a play berm or at its base is not recommended. Water and play tends to erode soil from around the roots of plantings on a berm. Any trees planted near the base of a hill (depends on height of berm) where sliding could occur should be 4m from the toe of the berm.
- Consider existing slopes as opportunities for increased play potential by adding a slide, step logs or vertical logs for climbing and sliding.

Preston Public School

Mulch Mounds

Berms made out of compacted mulch are durable and provide great play value (See Figure 4.01 Mulch Mound). They must be replenished annually or biannually, but otherwise require little maintenance.

Mulch Play Areas

- Shredded pine mulch is recommended for surfacing in play spaces and outdoor classrooms as it tends to mat together and stay in place.
- All perimeter containment installed around play equipment should be designed and constructed to maintain a level surface for the mulch and to prevent it from scattering.
- Replenish mulch every year to a depth of 150mm.

Sand Play

Sand provides a tactile experiences, it is a vital "loose part" that fosters construction play, dramatic play, social interactions, and experimentation with physical properties. Studies show that children and young people prefer to play with loose parts such as water, sticks, sand, ropes, and boxes more than traditional toys and play equipment, because they can use their imagination and have greater control in their play. Playing with sand, and in particular when it's combined with water, offers a lot of choice and opportunities for creativity.

Designing for a Successful Sand Play Area

LOCATION

Sand play areas should be located away from school building entrances and catch basins. Also avoid corners of buildings where wind can trap debris. Maximize the area of sand for improved play value. Large areas of sand will not attract visiting cats and other critters that prefer to use smaller enclosed sand boxes as a litter box. If a small sandbox is necessary then it must be covered with a breathable mesh netting material that allows air to circulate and sun to penetrate in order for the sand to dry out after water play or a rain. If sand play is not possible consider a soil pile; children love to dig in soil as well.

CONTAINMENT

Edging around sand can be flat-topped logs, armour stone, cedar timbers, or a rolled asphalt edge. This helps to limit the sand from spreading across the play area. Ensure the following:

Ideal height for edging is 300-380mm. If it is higher than 450mm, then 300mm of shredded pine mulch safety surfacing will be required.

Logs are peeled for durability.

Log corners are mitred to avoid gaps.

Stone corners are ground to 6mm radius and fit to avoid gaps

Coronation Public School

Installation

Depending on site conditions, a base of clear gravel topped with geotextile and/or weeping tile will be necessary to ensure proper drainage. The sand needs to be a minimum of 450mm (and ideally 600mm) deep to provide a challenging depth for digging.

Accessibility

Make the sand play area accessible with suitable surfacing and appropriate transfer systems.

- Armor stone or logs can be used to create a seat-level, transfer into sand play areas.
- Decks and ramps can be used to access sand areas, as long as the slope is a maximum of 5% and does not create a long transfer experience.
- Raised sand tables can provide a space for wheelchair uses.
- Stock tanks have become popular at schools, as they are sturdy (galvanized steel) and can be used for raised, accessible, contained sand (and dirt) play.

  For more information see:
  http://www.allabilitieswelcome.ca/Play spaces /files/Annex_H_Guidebook.pdf

Storage

Storage of buckets, shovels, scoops, molds, and other loose parts for construction is essential for enriching the sand play experience. Storage sheds are provided at all school sites in the WRDSB. In designing the storage space, make it accessible to the children so that they can retrieve and put away the materials themselves.

Shade

Many children will spend hours playing with sand and loose parts. Be sure to incorporate shade into the design of your sand play area. Natural shade can be accomplished by providing trees and/or large shrubs to the south and southwest sides of the sand play area. Because these natural shade options take longer to provide adequate shade, other options such as shade sails and umbrellas can be used to augment the plantings until they mature.

Type of Sand

The WRDSB uses coarse sand for sand play areas.

Maintenance

Occasional topping up and replacement will be required.

Suddaby Public School

Artistic and Musical Elements

Artistic and musical elements can make the school ground come alive and allow the creative abilities of the students, educators, and the community to find an outlet within the outdoor environment of the school. There are a variety of approaches that can be considered:

Activity Walls

Chalk walls can be included in outdoor learning spaces. Attach them to fences or shed walls, or create free standing structures as part of a fence or activity station. (See Figure 6.05 Chalk Panel)

- Use standard marine grade plywood 1200mm x 2400mm x 12.7mm.
- Apply one coat of primer and two coats of flat black paint.
- Mount top height 1500mm above grade.

Jean Steckle Public School

Acrylic paint walls can be created with tempered glass or plexiglas panels. Attach them to fences or sheds, or as free standing structures as part of a fence or activity corner.

Consider the following:

- Tempered glass does not scratch over time like plexiglas panels.
- Mount top height 1500mm above grade.

Murals and Asphalt Painting

Consider murals on asphalt, walls, or attached to fences.

- Use 1200mm x 2400mm x 12.7mm sheets of exterior plywood for murals to attach to school walls. Ensure your mural is not in direct sun so the colours do not fade and the paint does not weaken with direct ultra violet (UV) light.
- Prepare the asphalt area you are going to paint by cleaning it with a pressure-washer. Make sure you find an area of asphalt that is smooth and free of cracks and depressions. Mark out your area with tape. Use a good UV-resistant exterior latex paint.
- Paintings on asphalt will need to be touched up every year.
- Consider the following ideas for asphalt paintings to brighten the school grounds:

  - Sundials (large enough for students to be the 'human dial' and cast the shadow)
  - Maps
  - Mazes
  - Paths
  - Train tracks
  - Games such as snakes and ladders, tic-tac-toe, chess or checkers
  - Hundred square
  - Ponds and lily pads for hopping
  - River/stream
  - Rainbows
  - Planets, stars, moon
  - Pawprints, footprints

Artwork

Artwork can be attached to fences. Artwork related to the elements (sun, wind, rain) or that responds to weather can draw attention to the micro-climate within the school ground and can be tied to curriculum investigations of local weather systems. Artwork can also reflect your school's mascot and values, be used to raise funds and awareness for your project, add colour, or mimic a natural habitat with wildflower, butterfly and ladybug patterns. Durable ribbon material can also be used to weave through the fence in patterns and shapes. (See Figure 7.03 Art Panel)

Artwork, such as painted tiles, hand-made stepping stones, figures, statues, and decorative mosaic benches, can also be incorporated into gardens and around the school ground. These pieces of art can become focal points and make each school ground unique and different.

Breslau Public School

Suddaby Public School

Musical Elements

Incorporate drums, chimes, amandinda and other instruments of sound into gardens and play spaces. There are a number of companies that sell musical elements however schools can also consider the following homemade ideas to incorporate sound on the school ground.

- copper pipes cut to varying lengths
- pots and pans attached to the fence
- different pieces of wood

Gardens

FOOD GARDENS

Growing food connects children to the natural world – plant life cycles, soils, insects and pollinators. It helps them to make healthy eating choices and reinforces nutrition learning at school. It also connects them to local farming and local food systems, helping to build connections to their broader community. Growing food at schools has also been connected with enhanced scientific understanding, numeracy, literacy, and language skills. Many senior schools have connected food growing with business and entrepreneurial skill building.

Here are some guidelines for school food gardens:

- Create a theme: pizza gardens, herb gardens, three sisters garden
- Incorporate the food from the garden into school activities – healthy lunches, litterless lunches, etc.
- Consider maintenance and summer care.
- Raised beds are accessible for all. Include standing and wheelchair or sitting heights. Also, consider accessible garden tools.

Suddaby Public School

- Stock tanks have become popular at schools, as they are sturdy (galvanized steel) and can be used for gardens (as well as sand and dirt play).
- Provide a garden for each class to plant and maintain.
- Select vegetables that are easy to grow and can be harvested during the school year (spring or fall).
- Learn about companion planting, crop rotation, and organic gardening practices.
- Test the soil before starting a food garden.
- Connect with the local community, high schools, horticulture groups and community garden groups.

THEME GARDENS

Theme gardens create spaces that are unique to each school and school community. They are inclusive spaces that embrace school mottos, cultural diversity, learning, sharing and accessibility.

Gardens will vary based on each school and community. Some examples include:

- Spiral gardens
- Music gardens
- Peace gardens
- Storybook gardens
- Rainbow gardens
- Sensory gardens
- Fairy gardens
- Medicine-wheel gardens

HABITAT GARDENS

Natural habitat communities on school grounds provide excellent educational models for exploring plant-animal interactions and waste, water, energy.

Natural habitat communities vary by region, so consult local experts to help select plant species for the school's region. Some examples of natural habitat communities and habitat gardens include:

- Prairie butterfly garden
- Meadow–wet or dry
- Woodland bird garden
- Forest edge woodland–hedgerow
- Riparian pond garden
- Marsh or bog
- Storm water retention garden
- Rain garden
- Alvar and xeriscape gardens

See Evergreen's Native Plant Database for a list of plants for these garden types - http://nativeplants.evergreen.ca/

Forest Glen Public School

Nature Study Areas

Areas of the school ground that provide an opportunity to stop regular mowing and are left to naturalize allow children to view first-hand the ecological principle of succession.

- Provide mown pathways, mazes, labyrinths or mulched pathways throughout the area for exploration.
- Ensure all or part of the nature study area is accessible with mulch or limestone screening paths.
- Whips, seedling trees, shrubs, and native wildflowers can be planted by students in this area. Spacing should allow for annual mowing of woody invasive species.
- In areas where ticks are a concern, use a minimum 1m wide path of wood chips or limestone screenings so kids can move through the area without grasses brushing against them.
- If your Nature Study Area is adjacent to a neighbour's property be sure to maintain a mown strip approximately 2m wide along the fence lines to help define the area and keep vegetation from growing up onto the fence.
- Install signs to explain that the area will be managed and maintained—include information on how the Nature Study Area will be used by educators and add value to student's inquiry-based learning.
- Include bird feeders and houses, toad houses and other wildlife amenities.

Play Elements

The following interactive play elements described in this section will help to create a strong sense of place and opportunities for students to engage in stimulating, hands-on learning experiences, as well as support physical developmental needs.

Play Posts

Play posts mark an entrance to a path or space. They can be carved to add a connection to local community. They can also be used for play; to create the frame for a fort, to run through and around, to imagine and create. Add notches to them and they can become climbing challenges. Add rope between them, and they can become a balancing or navigating challenge. Versatile and sturdy, play posts add another creative element to outdoor play and learning spaces.

Design considerations:

- Posts should be round, peeled cedar 150–200mm diameter.
- Posts should be spaced a minimum of 900mm for safety and accessibility.
- The top of the post should be angled to a minimum of 30 degrees.
- Post heights in kindergarten spaces should be a maximum of 1350mm.
- Post heights for entrances and other spaces should be a standard height of 1350–1500mm.
- Sand posts prior to installation to ensure there are no rough edges.
- Ensure posts are free of splinters, stable and free of movement after installation.

(See Figures 6.01, 6.02 and 6.04 for installation details).

Tipis and Forts

Tipis and forts provide a meeting point, gathering place, and stage for dramatic and fantasy play. They provide a refuge and vantage point in the school landscape.

Design considerations:

- Ensure forts and tipis are accessible, including surfacing materials leading up to and around the elements, as well as the distance between poles. (See Figure 6.03 Tipi Poles)
- Incorporate themed and sensory gardens to increase the play and learning experience.
- Incorporate tarps or different platform levels to increase play value.

Suddaby Public School

Logs

Logs have tremendous play value as edging around paths and sand play areas or as an activity element on their own.

- Configure logs in a vertical step pattern, with varying widths and heights. (See Figure 6.04 Stepped Posts - Kindergarten).
- Log cookies of various diameters can be used for rolling, stacking, or 'stepping stones'.
- Sections of 100mm cedar logs can be used for constructing, rolling, and building.
- Logs with sawn tops can be used as balance beams. Configuring three sections of log together to make a zig-zag shape provides play, balance and seating.

Water Play

Water play features can provide many benefits on school grounds. WRDSB does not promote any standing water in the form of ponds, lakes, or moving water in the form of streams on school grounds. There are many other creative ways to incorporate water into the school ground for learning such as:

Rockway Public School

- Water walls made of built containers and channels or with found and recycled materials.
- Fill buckets and containers with water to use in the sand play area.
- Fill basins, water tables etc. that can be drained upon completion of activity.
- Be sure that all water levels are below 50mm.

Gates and Fences

Gates and fences can be opportunities for creating a sense of place. They provide opportunities for artistic expression, transition from one space to another, and a playful sense of entry. They also need to address the goals of the design and not impart barriers to entering or leaving the space.

Guiding Principles

Include colours, varied textures, look out points, murals, and mosaics to make gates and fences attractive areas of entry, transition, and play.

- Modify the fence line and height to make it more interesting.
- Include "nooks and crannies" by zigzagging the fence line.
- Gate openings must be a minimum of 1200mm wide to accommodate wheelchair and mobility devices.
- Maintenance access gates need to be 3000mm wide.
- Take care not to create climbing structures out of fences and gates.
- Do not provide access to fences around trees where students could climb from one to the other.

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- Do not fence off main play and learning features.
- Use galvanized brackets and screws. Do not use nails to secure fence or gate structures.

Different Types of Fences

The types of fencing often used in school grounds include:

- Vinyl-coated mesh or galvanized chain-link
- Wood
- Cedar post (See Figure 7.01 Wood Rail Fence)
- Palisade post fence (See Figure 7.02 Pallisade Post Fence)

Signage

Signs provide information and define spaces. They are also a way to build support and recognition for a school ground project as well as thank those who have contributed to the project.

Guiding Principles

- Provide signs at the entrance to special areas and at decision points along pathways.
- Use interpretive signs to educate people about the plants and habitats they may experience in naturalized spaces.
- Place signs at a comfortable height for people to read or touch: standard mounting height for students is 1200 mm (or lower for younger students) and 1500 mm for adults.
- Involve teachers and students in making signs.
- Consider accessibility and user needs including tactile, raised lettering, contrasting colour and braile.
- Engraved rocks provide vandal-deterrent long-term options.

Chapter 5

Maintaining Outdoor Play and Learning Environments

> **Diverse play settings can liberate creative energy from children. A breadth of action and interaction distinguishes a play environment that is well-designed and well-managed; that always has something new to offer, but at the same time is thought of as a familiar friend, a comfortable secure haven.**

Moore, Goltsman, *Play For All Guidelines*

Maintaining Outdoor Play and Learning Environments

It is necessary to consider the maintenance of the proposed play space features throughout the planning, design and construction process. A well-planned and organized maintenance plan will protect the investment of time, material, energy and money. As well, a maintenance budget will need to be kept at the school for the purchase of mulch, sand, tools, etc.

Creating Your Maintenance Plan

School committees will need to create a maintenance team. The maintenance team should keep a record of the weekly, monthly and annual work that needs to be done, and track what has been completed, and by whom, in a maintenance log.

Maintenance logs can be unique and reflect your school community, but contain similar elements for success:

- Clear description of maintenance tasks.
- Clear roles.
- Clear recording of tasks with date, time, and task completed.

Provide a copy of the maintenance plan to the principal for record keeping and to ensure the long-term sustainability of the project.

Remember to include students and the community in the maintenance of your outdoor plan and learning environment project:

- Classes can water and care for a tree in the yard.
- High school students can support summer maintenance tasks.
- Students (classes or the eco-club) can help top–up mulch annually.

Trees, Shrubs and Natural Areas

Appoint a School Tree Advocate

The School Tree Advocate is the voice of the trees on the school ground. Their role is to:

- Organize the tree care and maintenance strategy (weeding, watering, mulching) and make sure it is carried out effectively.
- Make sure the School Tree Advocate position is re-assigned when necessary.

Watering

- Trees require watering for 3 years after planting. Set up a weekly, bi-weekly, then monthly watering schedule with your school committee (See Appendix A: Watering Guidelines for Newly Planted Trees).

Trimming and Weeding

- Prune dead wood from trees and shrubs in spring and fall.
- Prune trees 2m from the ground to the lowest branches to allow good visibility when the tree is mature. Ensure branches are trimmed close to the trunk so they do not pose an ocular hazard.
- Remove low, side branches of large shrubs in areas where visibility and safety are a concern.
- Weed regularly around trees and shrubs, and before topping up mulch.
- Remove garbage and debris that is trapped in the tree cages.
- Remove any invasive and woody species from no-mow zones in spring and fall.

Mulch

- Top up the mulch annually in active play areas to a depth of 100mm and around trees to 150mm; less active areas can be topped up biannually.
- To add nutrients, top existing mulch with 25mm compost or worm castings, then replace mulch to a depth of 150mm each year.
- In the fall, keep leaves under the tree to break down into humus and naturally fertilize the tree.

Winter Care

- Check trees for ice and snow damage. Report any damage to the school principal or head custodian so damaged trees can be trimmed, or removed and replaced as needed.

Forest Hill Public School

Pathways

- Check and fix any areas that have received water damage and show signs of washed away mulch or screenings.
- Maintain mown paths through no-mow and garden areas on a regular basis throughout spring, summer and fall.
- Have a winter maintenance plan – who will shovel the pathways to ensure year-round accessible use?

Sand Areas

- Sand will migrate even with the best edging. Budget for annual top-up of sand play areas.
- Remove sticks and debris from sand areas so they do not pose a safety risk.
- Check sand areas for sharp objects on a regular basis.

Logs

- Check logs for large cracks and rot every year. Hardwood logs should last about 10 years before requiring replacement.

Gardens

- Weed and tidy up the garden area in the spring and fall
- Add compost and leaf litter in spring and fall
- Weed and harvest over the summer
- Monitor for vandalism over the summer

Vandalism

Vandalism of trees, buildings, and play features should be reported to the principal or head custodian immediately. Damage needs to be remediated as soon as it happens to deter future incidents of vandalism.

Vandalism can be deterred by selecting sturdy materials, effective planning and design, and involving the whole school community in your project.

FIGURES

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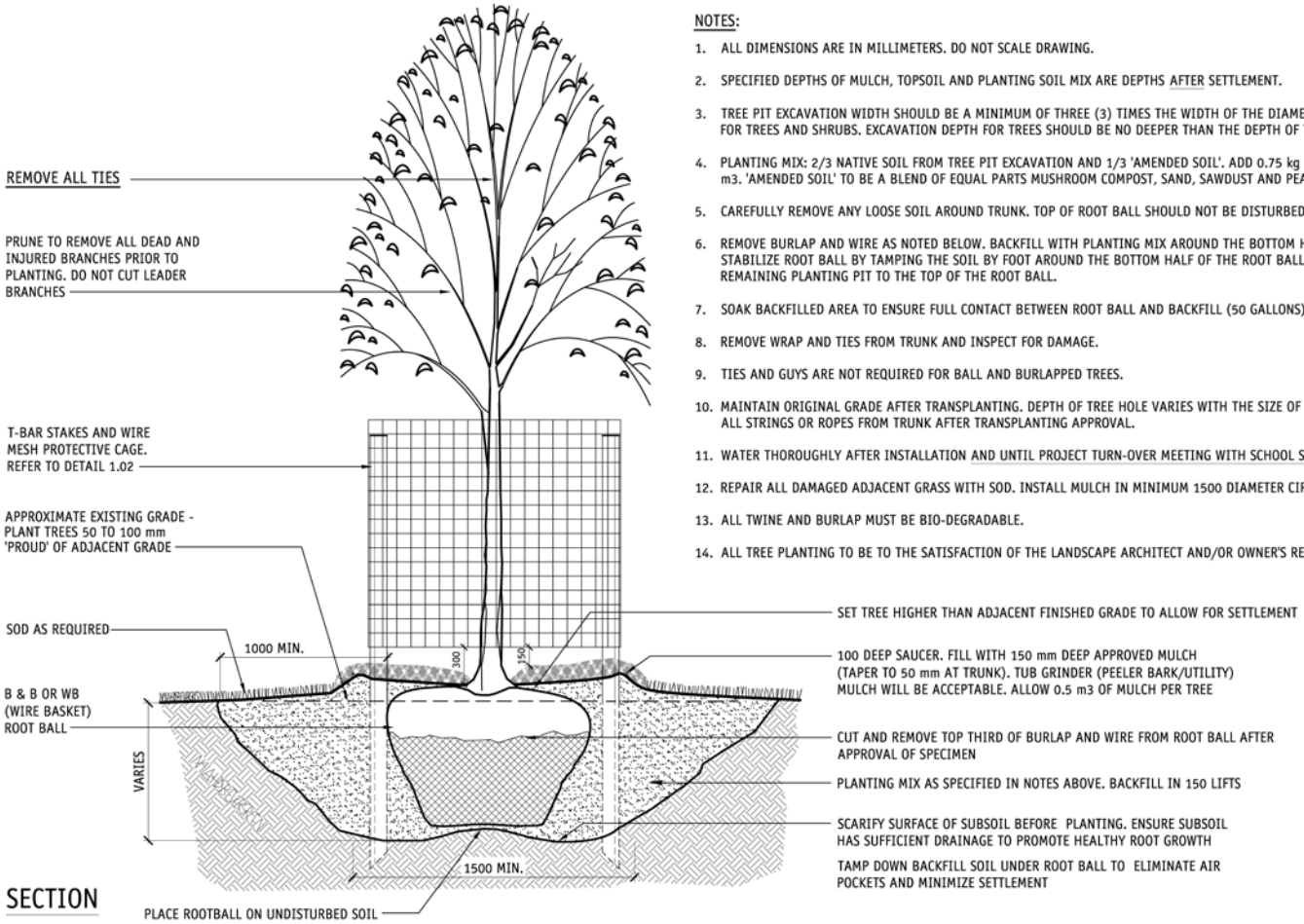

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH, TOPSOIL AND PLANTING SOIL MIX ARE DEPTHS AFTER SETTLEMENT.
3. TREE PIT EXCAVATION WIDTH SHOULD BE A MINIMUM OF THREE (3) TIMES THE WIDTH OF THE DIAMETER OF THE ROOT BALL FOR TREES AND SHRUBS. EXCAVATION DEPTH FOR TREES SHOULD BE NO DEEPER THAN THE DEPTH OF THE ROOT BALL.
4. PLANTING MIX: 2/3 NATIVE SOIL FROM TREE PIT EXCAVATION AND 1/3 'AMENDED SOIL'. ADD 0.75 kg SUPERPHOSPHATE PER m3. 'AMENDED SOIL' TO BE A BLEND OF EQUAL PARTS MUSHROOM COMPOST, SAND, SAWDUST AND PEAT.
5. CAREFULLY REMOVE ANY LOOSE SOIL AROUND TRUNK. TOP OF ROOT BALL SHOULD NOT BE DISTURBED OR COVERED WITH SOIL.
6. REMOVE BURLAP AND WIRE AS NOTED BELOW. BACKFILL WITH PLANTING MIX AROUND THE BOTTOM HALF OF THE ROOT BALL. STABILIZE ROOT BALL BY TAMPING THE SOIL BY FOOT AROUND THE BOTTOM HALF OF THE ROOT BALL. BACKFILL THE REMAINING PLANTING PIT TO THE TOP OF THE ROOT BALL.
7. SOAK BACKFILLED AREA TO ENSURE FULL CONTACT BETWEEN ROOT BALL AND BACKFILL (50 GALLONS).
8. REMOVE WRAP AND TIES FROM TRUNK AND INSPECT FOR DAMAGE.
9. TIES AND GUYS ARE NOT REQUIRED FOR BALL AND BURLAPPED TREES.
10. MAINTAIN ORIGINAL GRADE AFTER TRANSPLANTING. DEPTH OF TREE HOLE VARIES WITH THE SIZE OF THE ROOT BALL. REMOVE ALL STRINGS OR ROPES FROM TRUNK AFTER TRANSPLANTING APPROVAL.
11. WATER THOROUGHLY AFTER INSTALLATION AND UNTIL PROJECT TURN-OVER MEETING WITH SCHOOL STAFF.
12. REPAIR ALL DAMAGED ADJACENT GRASS WITH SOD. INSTALL MULCH IN MINIMUM 1500 DIAMETER CIRCLE OVER TREE PIT .
13. ALL TWINE AND BURLAP MUST BE BIO-DEGRADABLE.
14. ALL TREE PLANTING TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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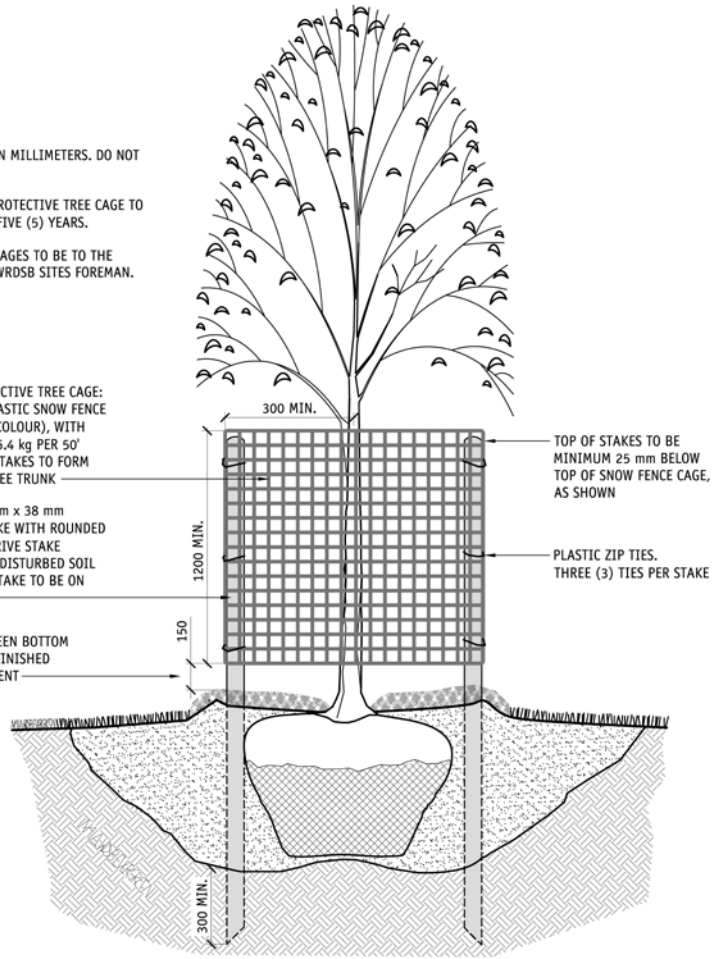
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Deciduous Tree Planting - Soft Surface	DETAIL # 1.01

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. PLASTIC SNOW FENCE PROTECTIVE TREE CAGE TO REMAIN IN PLACE FOR FIVE (5) YEARS.
3. ALL PROTECTIVE TREE CAGES TO BE TO THE SATISFACTION OF THE WRDSB SITES FOREMAN.



SECTION

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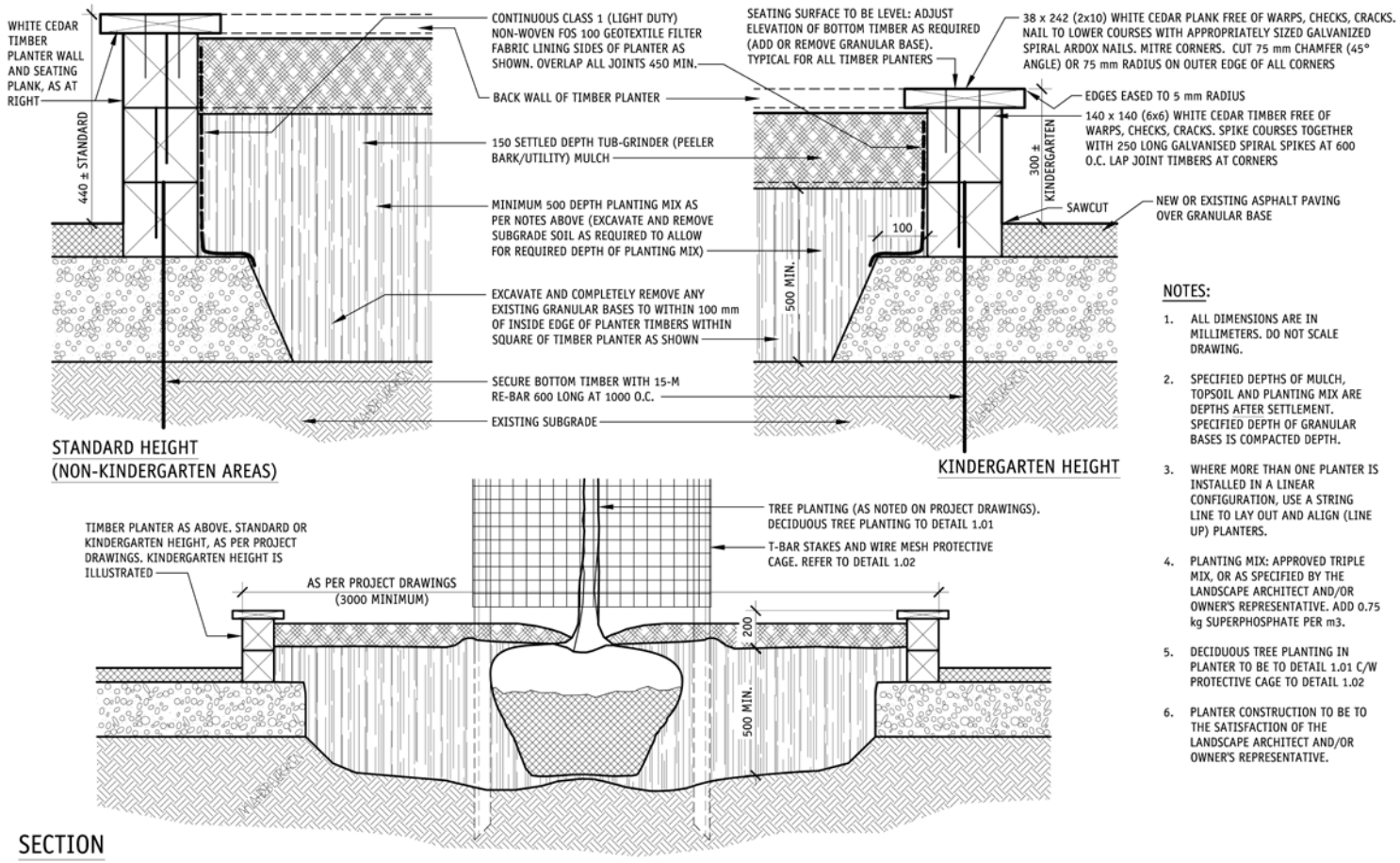
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN Imagine your city with nature	northwood associates landscape architects ltd.	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Protective Tree Cage - Deciduous Trees	DETAIL # 1.02



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH, TOPSOIL AND PLANTING MIX ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES IS COMPACTED DEPTH.
3. WHERE MORE THAN ONE PLANTER IS INSTALLED IN A LINEAR CONFIGURATION, USE A STRING LINE TO LAY OUT AND ALIGN (LINE UP) PLANTERS.
4. PLANTING MIX: APPROVED TRIPLE MIX, OR AS SPECIFIED BY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. ADD 0.75 kg SUPERPHOSPHATE PER m3.
5. DECIDUOUS TREE PLANTING IN PLANTER TO BE TO DETAIL 1.01 C/W PROTECTIVE CAGE TO DETAIL 1.02
6. PLANTER CONSTRUCTION TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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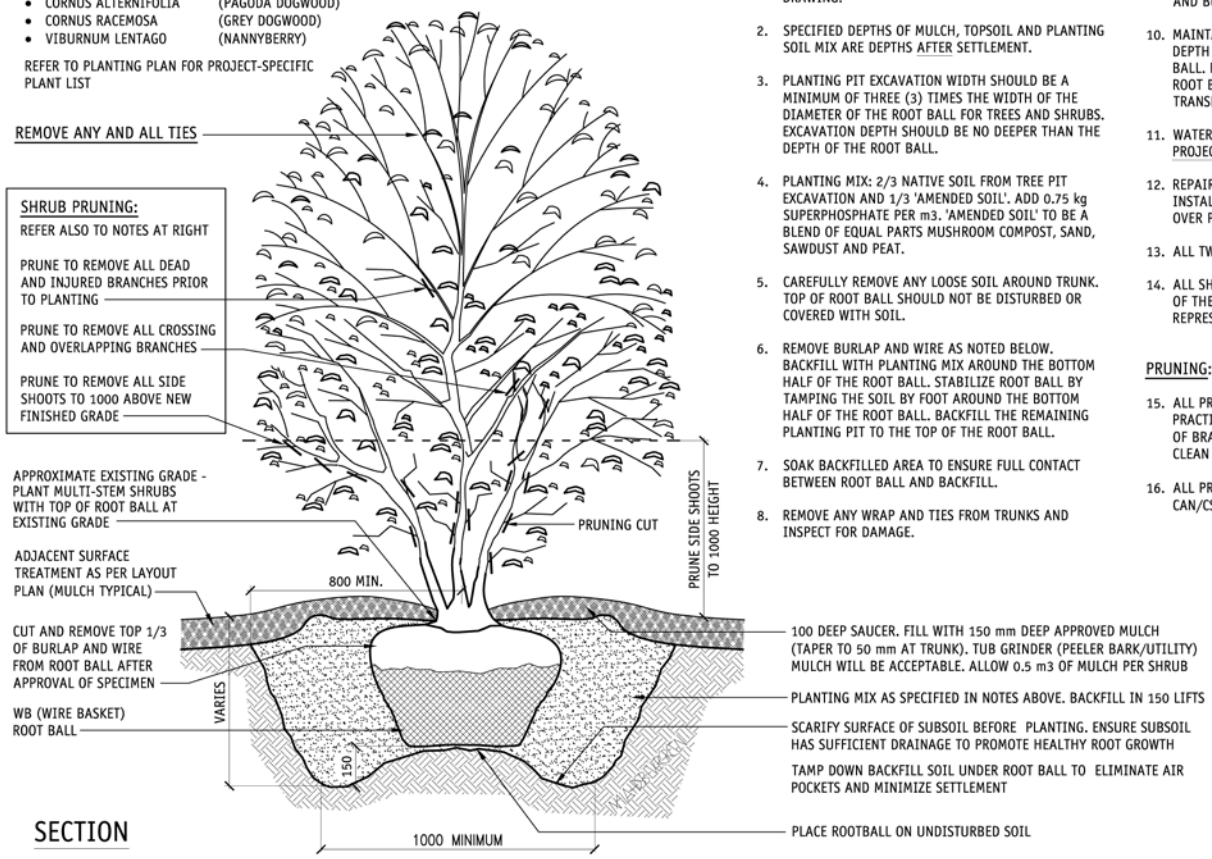
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Planter - Timber - Kindergarten - Standard	DETAIL # 1.03

PLANT LIST

SHRUB PLANTINGS ON SCHOOL GROUNDS TO BE MULTI-STEM SPECIMEN SHRUBS IN WIRE BASKETS, 1800 TO 2400 HEIGHT AND LIMITED TO:

- AMELANCHIER CANADENSIS (SERVICEBERRY)
- CORNUS ALTERNIFOLIA (PAGODA DOGWOOD)
- CORNUS RACEMOSA (GREY DOGWOOD)
- VIBURNUM LENTAGO (NANNYBERRY)

REFER TO PLANTING PLAN FOR PROJECT-SPECIFIC PLANT LIST



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH, TOPSOIL AND PLANTING SOIL MIX ARE DEPTHS AFTER SETTLEMENT.
3. PLANTING PIT EXCAVATION WIDTH SHOULD BE A MINIMUM OF THREE (3) TIMES THE WIDTH OF THE DIAMETER OF THE ROOT BALL FOR TREES AND SHRUBS. EXCAVATION DEPTH SHOULD BE NO DEEPER THAN THE DEPTH OF THE ROOT BALL.
4. PLANTING MIX: 2/3 NATIVE SOIL FROM TREE PIT EXCAVATION AND 1/3 'AMENDED SOIL'. ADD 0.75 kg SUPERPHOSPHATE PER m3. 'AMENDED SOIL' TO BE A BLEND OF EQUAL PARTS MUSHROOM COMPOST, SAND, SAWDUST AND PEAT.
5. CAREFULLY REMOVE ANY LOOSE SOIL AROUND TRUNK. TOP OF ROOT BALL SHOULD NOT BE DISTURBED OR COVERED WITH SOIL.
6. REMOVE BURLAP AND WIRE AS NOTED BELOW. BACKFILL WITH PLANTING MIX AROUND THE BOTTOM HALF OF THE ROOT BALL. STABILIZE ROOT BALL BY TAMPING THE SOIL BY FOOT AROUND THE BOTTOM HALF OF THE ROOT BALL. BACKFILL THE REMAINING PLANTING PIT TO THE TOP OF THE ROOT BALL.
7. SOAK BACKFILLED AREA TO ENSURE FULL CONTACT BETWEEN ROOT BALL AND BACKFILL.
8. REMOVE ANY WRAP AND TIES FROM TRUNKS AND INSPECT FOR DAMAGE.
9. TIES AND GUYS ARE NOT REQUIRED FOR WB OR BALL AND BURLAPPED SHRUBS.
10. MAINTAIN ORIGINAL GRADE AFTER TRANSPLANTING. DEPTH OF HOLE VARIES WITH THE SIZE OF THE ROOT BALL. REMOVE ALL STRINGS OR ROPES FROM TOP OF ROOT BALL AND AROUND TRUNKS AFTER TRANSPLANTING APPROVAL.
11. WATER THOROUGHLY AFTER INSTALLATION AND UNTIL PROJECT TURN-OVER MEETING WITH SCHOOL STAFF.
12. REPAIR ALL DAMAGED ADJACENT GRASS WITH SOD. INSTALL MULCH IN MINIMUM 1000 DIAMETER CIRCLE OVER PLANTING PIT OR AS SHOWN ON LAYOUT PLAN.
13. ALL TWINE AND BURLAP MUST BE BIO-DEGRADABLE.
14. ALL SHRUB PLANTINGS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

PRUNING:

15. ALL PRUNING TO BE TO BEST ARBORICULTURAL PRACTICE. ALL CUTS TO BE MADE AT NARROWEST PART OF BRANCH (DO NOT DAMAGE BRANCH COLLAR) USING CLEAN AND SHARP TOOLS.
16. ALL PROTRUSION HAZARDS (AS DEFINED BY CAN/CSA-Z614 LATEST EDITION) ARE TO BE REMOVED.

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WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

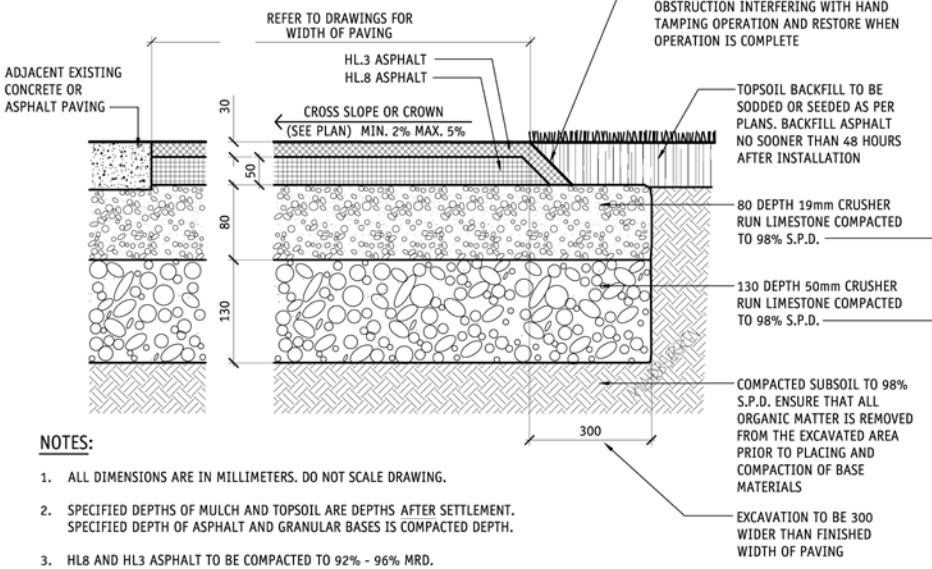
Multi-stem Specimen Shrub Planting & Pruning

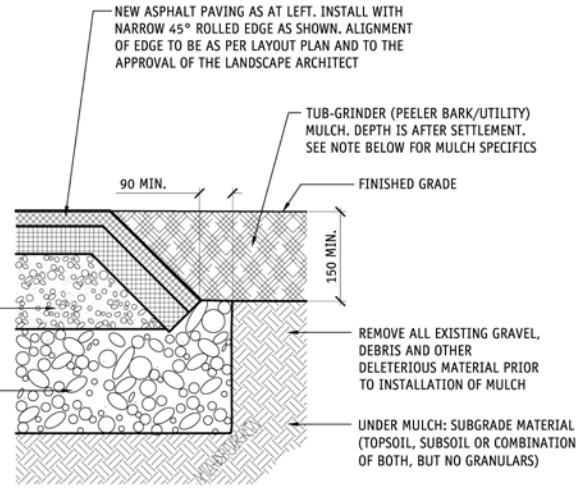
DETAIL # 1.04

RUMBLE STRIPS:

INCORPORATE 'RUMBLE' STRIPS INTO PAVING (WHERE INDICATED ON PROJECT DRAWINGS) DURING ASPHALT INSTALLATION AS FOLLOWS:

1. AFTER ROLLING OF PAVING AND WHILE ASPHALT IS STILL HOT, LAY OUT CHAIN LINK FENCE TOP RAIL (45 mm Ø SCHEDULE 40, LENGTHS AS REQUIRED) ON SURFACE OF ASPHALT AT 150 O.C. AND POUND INTO HOT ASPHALT TO APPROXIMATELY 25 mm DEPTH.
2. REMOVE RAILS AND ALLOW ASPHALT TO COMPLETELY COOL AND CURE PRIOR TO USE.





NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF ASPHALT AND GRANULAR BASES IS COMPACTED DEPTH.
3. HL8 AND HL3 ASPHALT TO BE COMPACTED TO 92% - 96% MRD.
4. ENSURE THAT THERE IS A SMOOTH TRANSITION BETWEEN HARD AND SOFT SURFACES (ASPHALT TO SOD AND ASPHALT TO MULCH).
5. EXISTING GRANULAR BASES ON SITE MAY BE REUSED AS NEW GRANULAR BASE FOR NEW PAVING INSTALLATIONS, PROVIDED THAT MATERIAL IS CLEAN AND THAT NEW BASE IS INSTALLED AS PER DETAIL(S).
6. ASPHALT PAVING AND EDGING TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

SECTION

ASPHALT/MULCH INTERFACE

NOTE: THIS DETAIL IS NOT TO BE USED FOR ASPHALT/PLAYGROUND PROTECTIVE SURFACING INTERFACE

'TUB-GRINDER' AND 'PEELER BARK' MULCH:

TUB-GRINDER MULCH TO BE TWICE TUB-GROUND AND SHALL BE SHREDDED AND FIBROUS AND NOT CONTAIN CHIPS OF WOOD OR BARK.

PEELER BARK MULCH TO BE SHREDDED BARK MULCH - THE MATERIAL (BARK) PEELED OFF OF HARDWOOD AND/OR CEDAR LOGS AT A SAWMILL. PEELER BARK MULCH TO BE COMPRISED OF 90% BARK AND 10% WOOD AND SHALL NOT CONTAIN CHIPS OF WOOD OR BARK.

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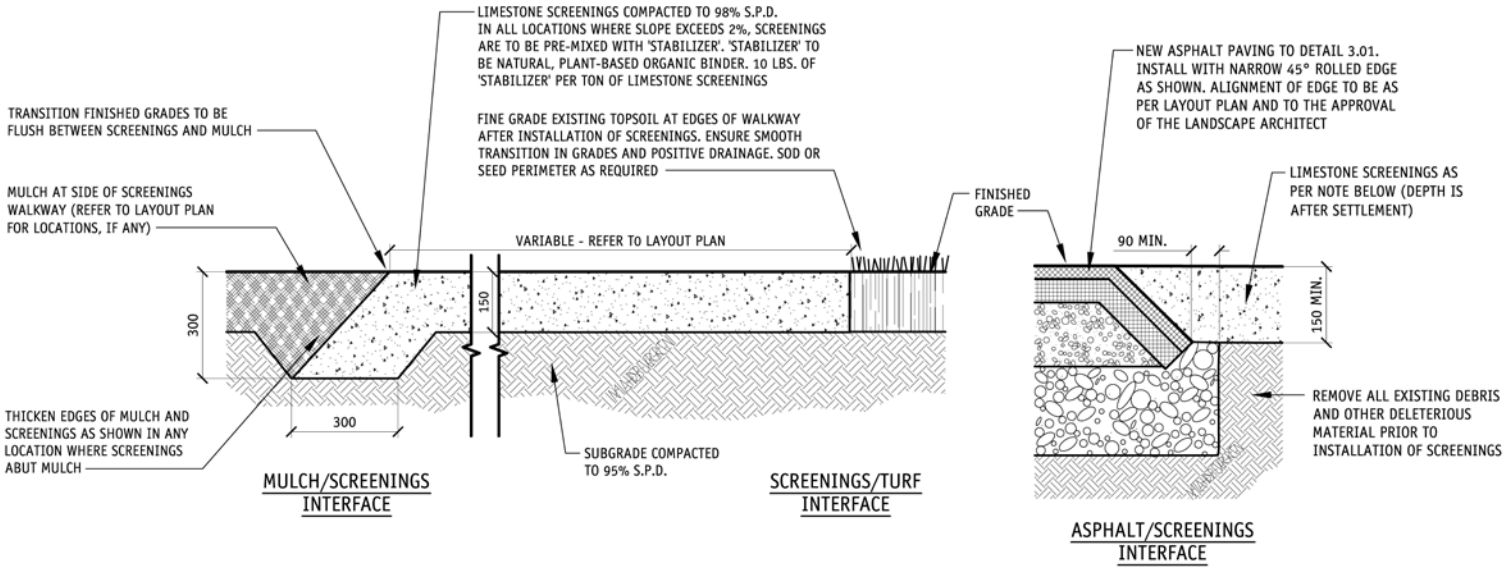
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Asphalt Paving - Medium Duty	DETAIL # 2.01



NOTE: THIS DETAIL IS NOT TO BE USED FOR ASPHALT/PLAYGROUND PROTECTIVE SURFACING INTERFACE

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF LIMESTONE SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. LIMESTONE SCREENINGS TO BE A FINE CRUSHED LIMESTONE PRODUCT COMPOSED OF 50% LIMESTONE DUST AND THE BALANCE COMPOSED OF AN EVEN SPREAD OF PARTICLES UP TO 3 mm SIZE.
4. INSTALLATION OF LIMESTONE SCREENINGS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

SECTION

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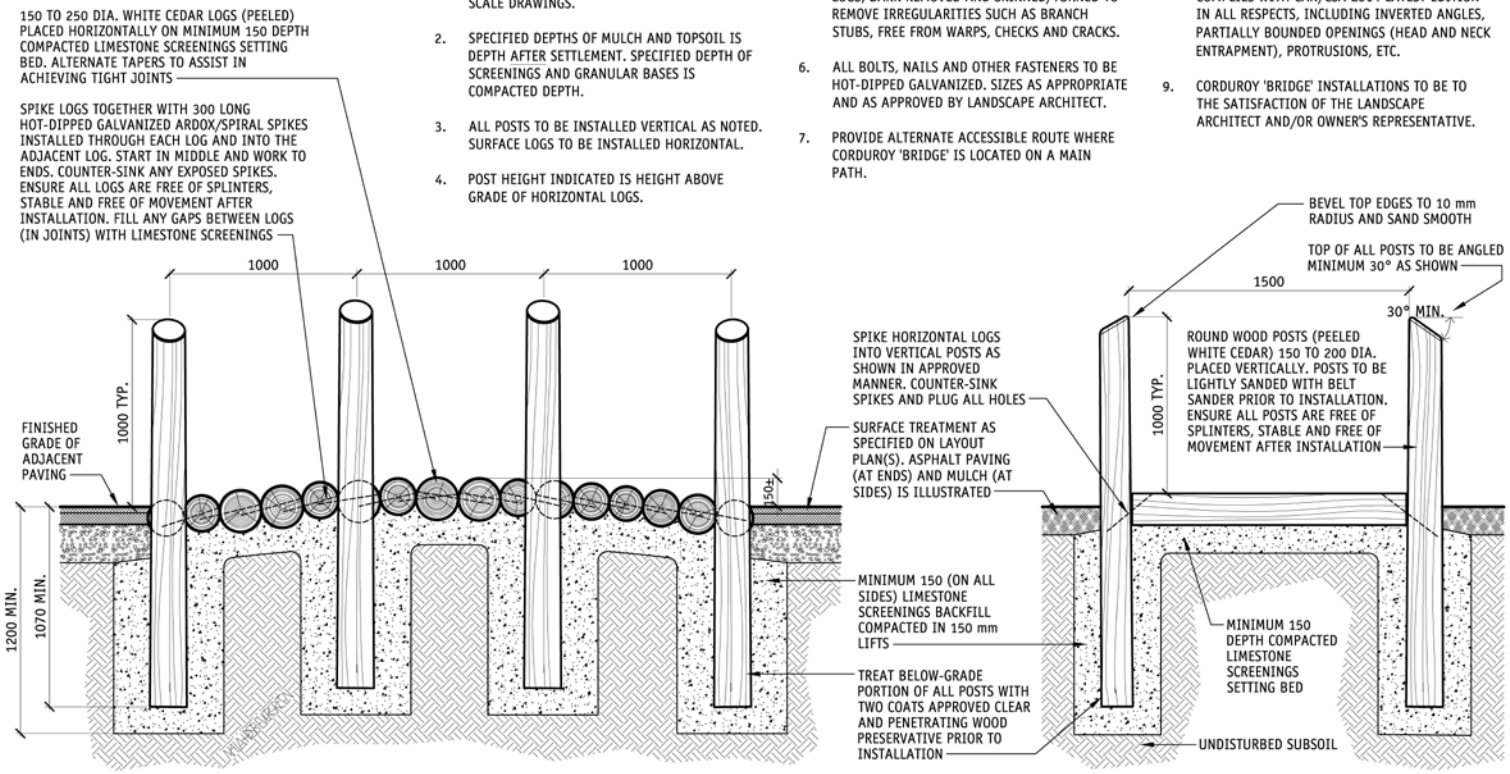
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Limestone Screenings - Walkway	DETAIL # 2.02

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL POSTS TO BE INSTALLED VERTICAL AS NOTED. SURFACE LOGS TO BE INSTALLED HORIZONTAL.
4. POST HEIGHT INDICATED IS HEIGHT ABOVE GRADE OF HORIZONTAL LOGS.
5. ALL WOOD TO BE WHITE CEDAR, ROUND POSTS OR LOGS, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS, FREE FROM WARPS, CHECKS AND CRACKS.
6. ALL BOLTS, NAILS AND OTHER FASTENERS TO BE HOT-DIPPED GALVANIZED. SIZES AS APPROPRIATE AND AS APPROVED BY LANDSCAPE ARCHITECT.
7. PROVIDE ALTERNATE ACCESSIBLE ROUTE WHERE CORDUROY 'BRIDGE' IS LOCATED ON A MAIN PATH.
8. NOTE: ENSURE THAT CORDUROY 'BRIDGE' COMPLIES WITH CAN/CSA-Z614 LATEST EDITION IN ALL RESPECTS, INCLUDING INVERTED ANGLES, PARTIALLY BOUNDED OPENINGS (HEAD AND NECK ENTRAPMENT), PROTRUSIONS, ETC.
9. CORDUROY 'BRIDGE' INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.



LONGITUDINAL SECTION

CROSS SECTION

WOODEN CORDUROY 'BRIDGE' ILLUSTRATED ON THIS DETAIL IS APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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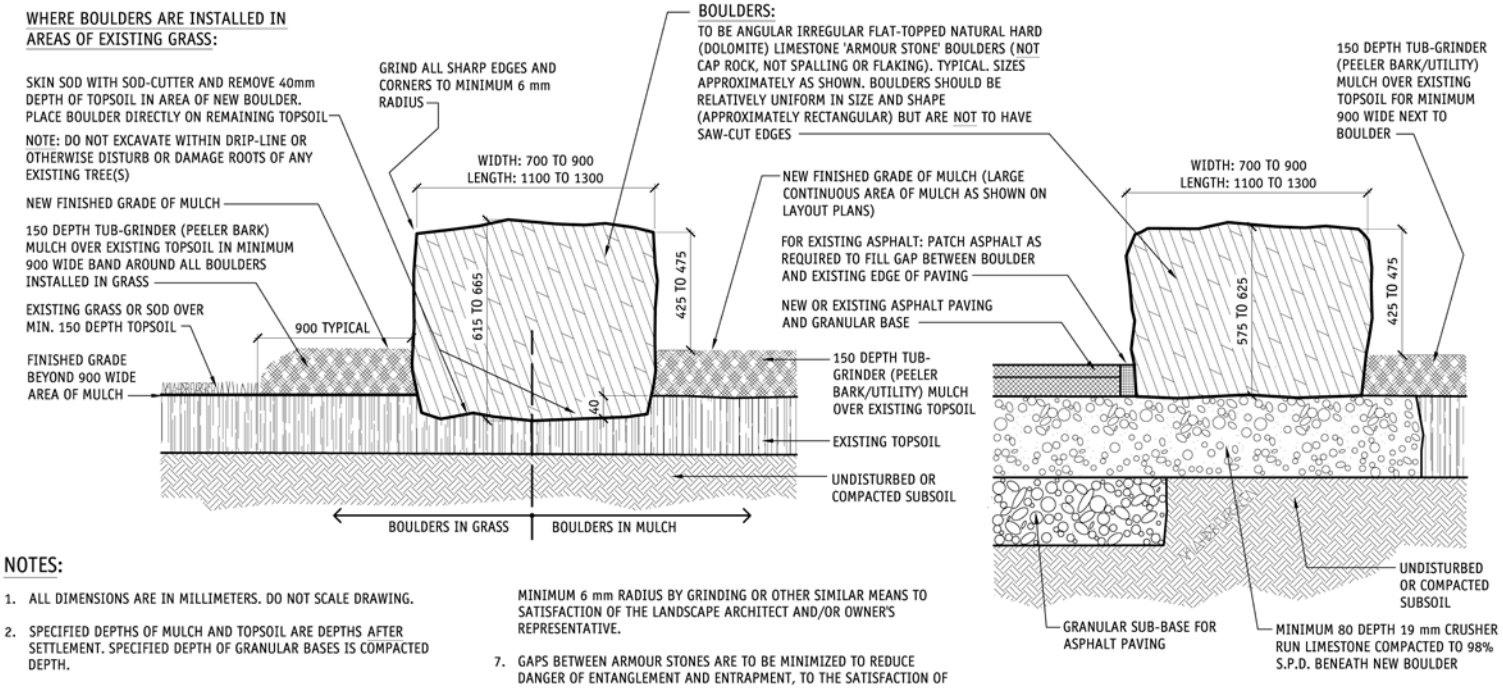
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Corduroy 'Bridge'	DETAIL # 2.03



BOULDERS ADJACENT ASPHALT PAVING

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES IS COMPACTED DEPTH.
3. ALL ARMOUR STONE BOULDERS TO BE SIZES AS INDICATED ABOVE.
4. INSTALL ALL BOULDERS WITH MINIMUM ONE-FIFTH BELOW FINISHED GRADE OF SURROUNDING MULCH AS SHOWN.
5. ENSURE THAT ALL BOULDERS ARE STABLE AND FREE FROM ALL MOVEMENT AFTER INSTALLATION IS COMPLETE.
6. PRIOR TO PROJECT COMPLETION ENSURE THAT ALL SHARP CORNERS AND EDGES ON EXPOSED SIDES OF STONES ARE ELIMINATED (ROUNDED) TO MINIMUM 6 mm RADIUS BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
7. GAPS BETWEEN ARMOUR STONES ARE TO BE MINIMIZED TO REDUCE DANGER OF ENTANGLEMENT AND ENTRAPMENT, TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. GAPS ARE EITHER TO BE LESS THAN 50mm OR GREATER THAN 2000 mm.
8. ENSURE MINIMUM 2000 DISTANCE BETWEEN ALL BOULDERS AND TREE TRUNKS AND/OR TREE CAGES.
9. ENSURE THAT ALL ARMOUR STONE BOULDERS ARE INSTALLED WITH SEATING SURFACE LEVEL.
10. INSTALLATION OF BOULDERS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

SECTION

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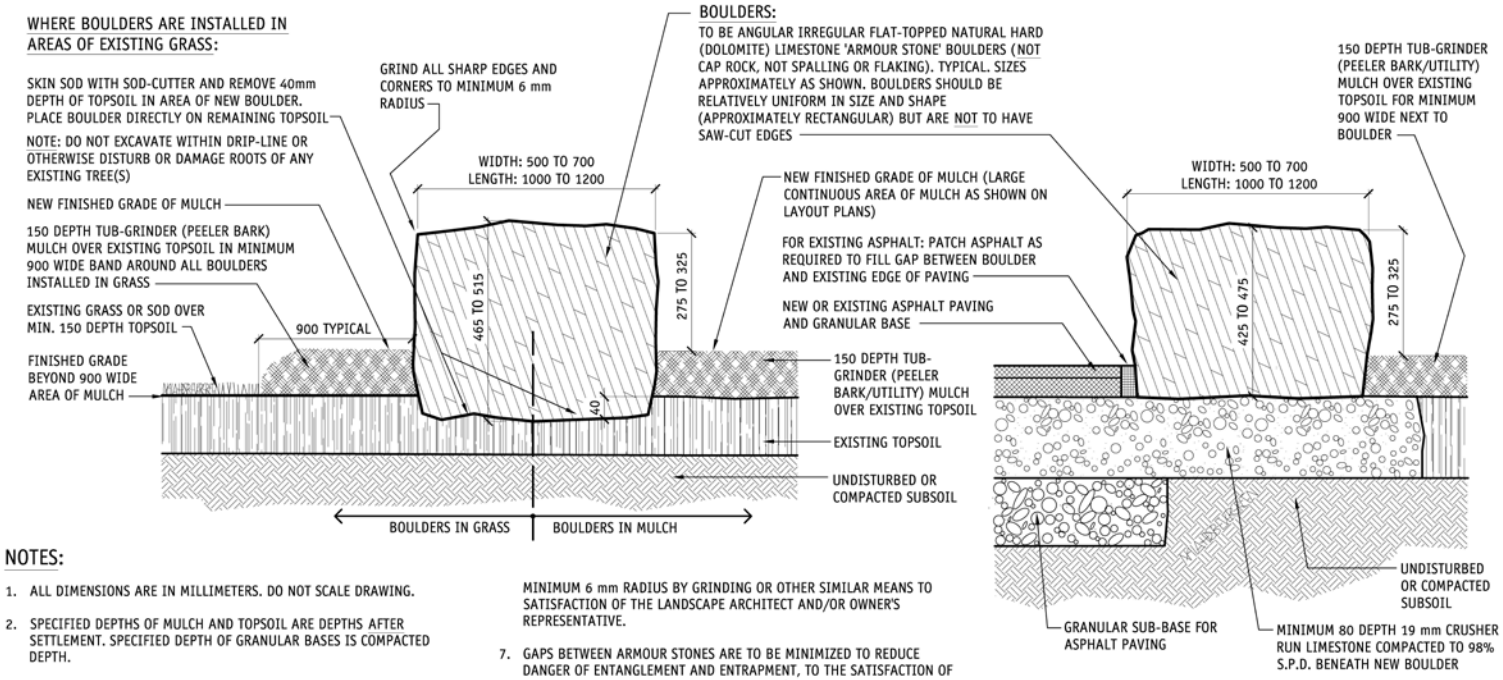
WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

Armour Stone Seating - Single Boulders - Standard

DETAIL # 3.01



NOTES:

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2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES IS COMPACTED DEPTH.
3. ALL ARMOUR STONE BOULDERS TO BE SIZES AS INDICATED ABOVE.
4. INSTALL ALL BOULDERS WITH MINIMUM ONE-FIFTH BELOW FINISHED GRADE OF SURROUNDING MULCH AS SHOWN.
5. ENSURE THAT ALL BOULDERS ARE STABLE AND FREE FROM ALL MOVEMENT AFTER INSTALLATION IS COMPLETE.
6. PRIOR TO PROJECT COMPLETION ENSURE THAT ALL SHARP CORNERS AND EDGES ON EXPOSED SIDES OF STONES ARE ELIMINATED (ROUNDED) TO MINIMUM 6 mm RADIUS BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
7. GAPS BETWEEN ARMOUR STONES ARE TO BE MINIMIZED TO REDUCE DANGER OF ENTANGLEMENT AND ENTRAPMENT, TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. GAPS ARE EITHER TO BE LESS THAN 50mm OR GREATER THAN 2000 mm.
8. ENSURE MINIMUM 2000 DISTANCE BETWEEN ALL BOULDERS AND TREE TRUNKS AND/OR TREE CAGES.
9. ENSURE THAT ALL ARMOUR STONE BOULDERS ARE INSTALLED WITH SEATING SURFACE LEVEL.
10. INSTALLATION OF BOULDERS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

SECTION

DIMENSIONS AND BOULDER SIZES ILLUSTRATED ON THIS DETAIL ARE APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

Armour Stone Seating - Single Boulders - Kindergarten

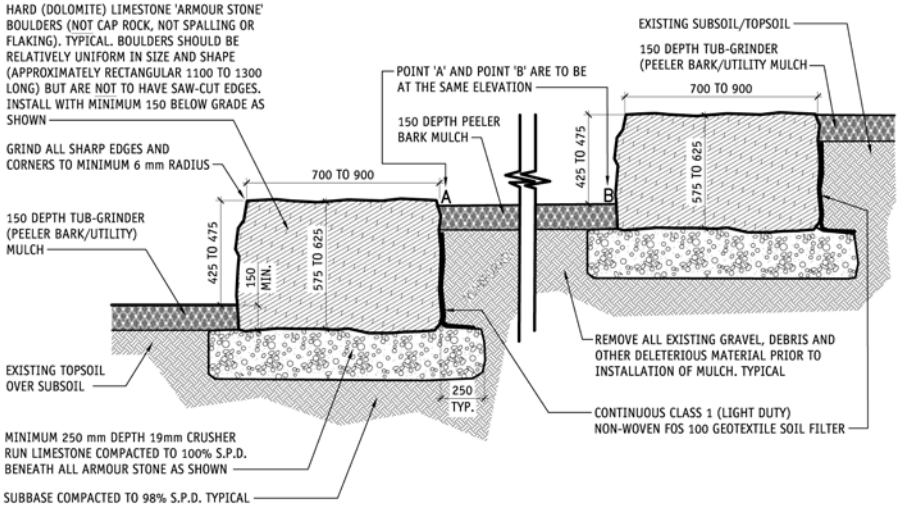
DETAIL # 3.02

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES IS COMPACTED DEPTH.
3. ENSURE THAT ANY SHARP CORNERS AND EDGES ON EXPOSED SIDES OF 'STONES' ARE ELIMINATED (ROUNDED) TO MINIMUM 6 mm RADIUS BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
4. GAPS BETWEEN ARMOUR STONE BOULDERS ARE TO BE MINIMIZED TO REDUCE DANGER OF ENTANGLEMENT AND ENTRAPMENT, TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. GAPS GREATER THAN 50mm WILL NOT BE ACCEPTED. FILL GAPS BETWEEN BOULDERS WITH LIMESTONE SCREENINGS MIXED WITH 10 LBS OF 'STABILIZER' PER TON OF SCREENINGS. 'STABILIZER' TO BE NATURAL, PLANT-BASED ORGANIC BINDER. ALTERNATIVELY, FILL LARGE GAPS WITH HAND-PACKED ASPHALT PAVING, AS APPROPRIATE AND AS DIRECTED BY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
5. ENSURE THAT ALL BOULDERS ARE STABLE AND FREE FROM ALL MOVEMENT.
6. ENSURE THAT ALL ARMOUR STONE BOULDERS ARE INSTALLED WITH SEATING SURFACE LEVEL.
7. ENSURE MINIMUM 2000 DISTANCE BETWEEN ALL BOULDERS AND TREE TRUNKS AND/OR TREE CAGES.
8. EACH TIER OF SEATING IS TO BE INSTALLED WITH TOPS LEVEL (NOT STEPPED DOWN) UNLESS SPECIFICALLY NOTED OTHERWISE. REFER TO GRADING PLAN FOR TOP OF WALL (T.W.) ELEVATIONS.
9. INSTALLATION OF BOULDERS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

BOULDERS:

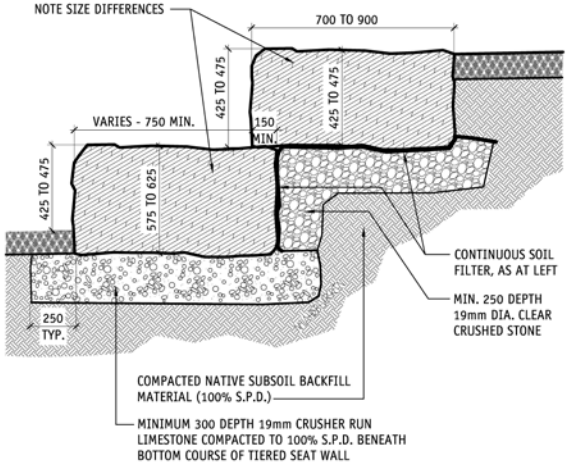
TO BE ANGULAR IRREGULAR FLAT-TOPPED NATURAL HARD (DOLOMITE) LIMESTONE 'ARMOUR STONE' BOULDERS (NOT CAP ROCK, NOT SPALLING OR FLAKING). TYPICAL. BOULDERS SHOULD BE RELATIVELY UNIFORM IN SIZE AND SHAPE (APPROXIMATELY RECTANGULAR 1100 TO 1300 LONG) BUT ARE NOT TO HAVE SAW-CUT EDGES. INSTALL WITH MINIMUM 150 BELOW GRADE AS SHOWN



SECTION

BOULDERS:

SAME AS PER NOTE AT LEFT. NOTE SIZE DIFFERENCES



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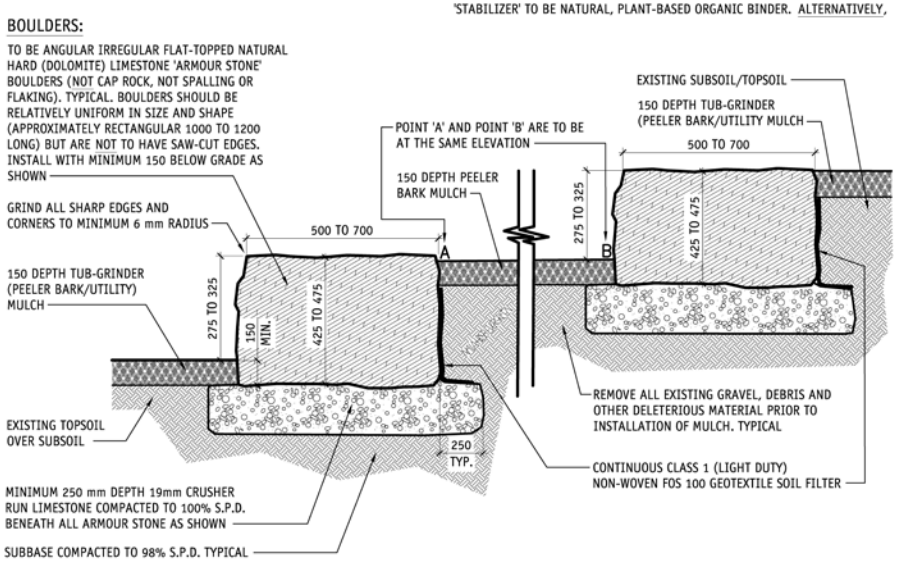
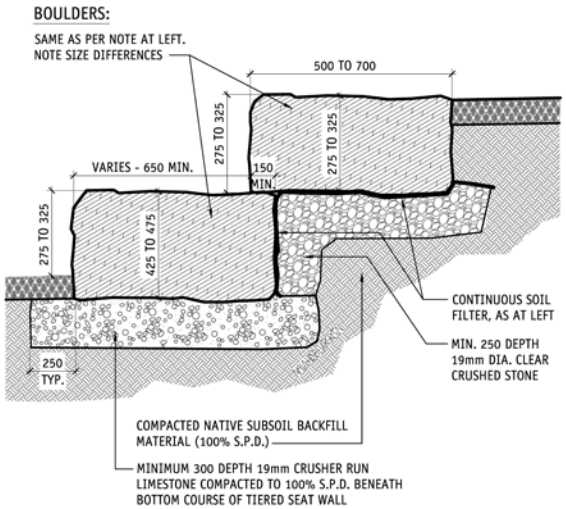
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Armour Stone Seating - Tiered - Standard	DETAIL # 3.03

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES IS COMPACTED DEPTH.
3. ENSURE THAT ANY SHARP CORNERS AND EDGES ON EXPOSED SIDES OF 'STONES' ARE ELIMINATED (ROUNDED) TO MINIMUM 6 mm RADIUS BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
4. GAPS BETWEEN ARMOUR STONE BOULDERS ARE TO BE MINIMIZED TO REDUCE DANGER OF ENTANGLEMENT AND ENTRAPMENT, TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. GAPS GREATER THAN 50mm WILL NOT BE ACCEPTED. FILL GAPS BETWEEN BOULDERS WITH LIMESTONE SCREENINGS MIXED WITH 10 LBS OF 'STABILIZER' PER TON OF SCREENINGS. 'STABILIZER' TO BE NATURAL, PLANT-BASED ORGANIC BINDER. ALTERNATIVELY, FILL LARGE GAPS WITH HAND-PACKED ASPHALT PAVING, AS APPROPRIATE AND AS DIRECTED BY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
5. ENSURE THAT ALL BOULDERS ARE STABLE AND FREE FROM ALL MOVEMENT.
6. ENSURE THAT ALL ARMOUR STONE BOULDERS ARE INSTALLED WITH SEATING SURFACE LEVEL.
7. ENSURE MINIMUM 2000 DISTANCE BETWEEN ALL BOULDERS AND TREE TRUNKS AND/OR TREE CAGES.
8. EACH TIER OF SEATING IS TO BE INSTALLED WITH TOPS LEVEL (NOT STEPPED DOWN) UNLESS SPECIFICALLY NOTED OTHERWISE. REFER TO GRADING PLAN FOR TOP OF WALL (T.W.) ELEVATIONS.
9. INSTALLATION OF BOULDERS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.





SECTION

DIMENSIONS AND BOULDER SIZES ILLUSTRATED ON THIS DETAIL ARE APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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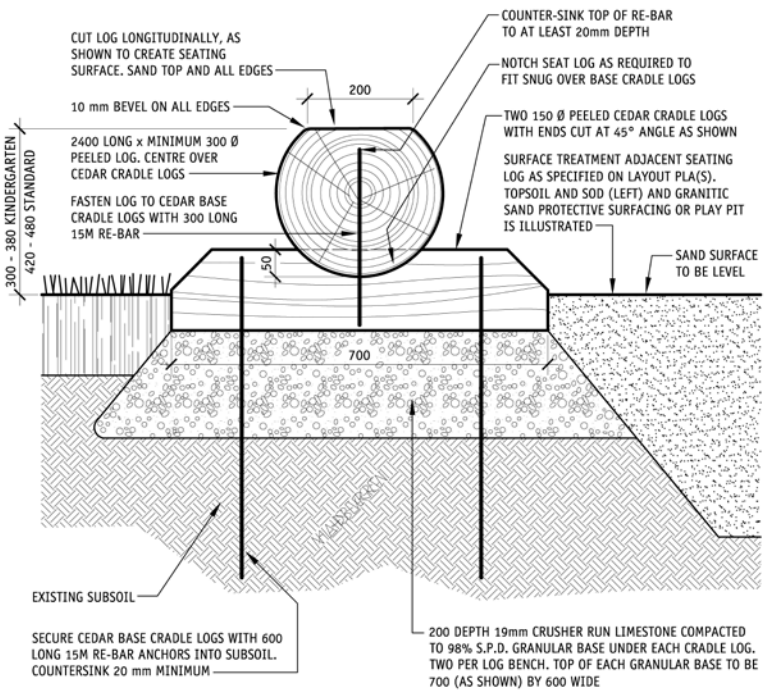
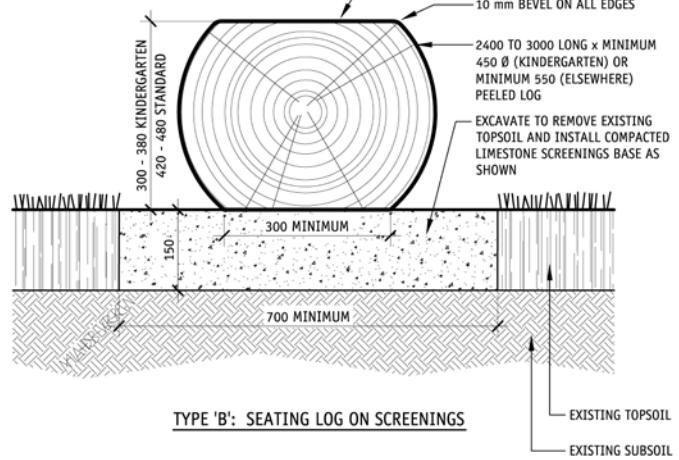
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Armour Stone Seating - Tiered - Kindergarten	DETAIL # 3.04



TYPE 'A': SEATING LOG ON CRADLES

SECTION

NOTE: MULTIPLE TYPE 'B' SEATING LOGS MAY BE INSTALLED END-TO-END IN A ZIG-ZAG PATTERN. ANGLE CUT ENDS TO CREATE MITRE JOINT. ENSURE MAXIMUM 6 mm GAP AT JOINT.



TYPE 'B': SEATING LOG ON SCREENINGS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF SAND AND TOPSOIL IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF LIMESTONE SCREENINGS AND GRANULARS IS COMPACTED DEPTH.
3. ALL LOGS TO BE INSTALLED WITH SEATING SURFACE LEVEL END-TO-END.
4. ALL SEATING LOGS TO BE SOLID HARDWOOD (OAK, ASH OR MAPLE) OR EASTERN WHITE CEDAR WITH BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS.
5. ALL TIMBER, LUMBER AND LOGS TO BE FREE FROM WARPS, CHECKS AND CRACKS.
6. LOG BENCH INSTALLATION TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Seating Log - Standard and Kindergarten	DETAIL # 3.05

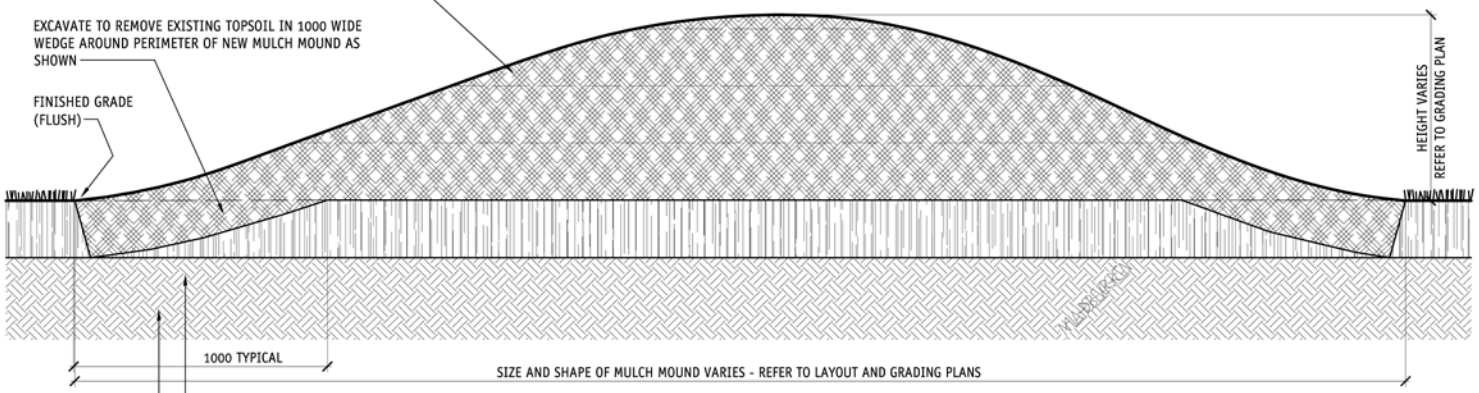
'TUB-GRINDER' AND 'PEELER BARK' MULCH:

TUB-GRINDER MULCH TO BE TWICE TUB-GROUND AND SHALL BE SHREDDED AND FIBROUS AND NOT CONTAIN CHIPS OF WOOD OR BARK.

PEELER BARK MULCH TO BE SHREDDED BARK MULCH - THE MATERIAL (BARK) PEELED OFF OF HARDWOOD AND/OR CEDAR LOGS AT A SAWMILL. PEELER BARK MULCH TO BE COMPRISED OF 90% BARK AND 10% WOOD AND SHALL NOT CONTAIN CHIPS OF WOOD OR BARK.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH IS DEPTH AFTER COMPACTION AND SETTLEMENT.
3. ENSURE THAT THERE IS A SMOOTH TRANSITION BETWEEN MULCH MOUND AND ADJACENT SURFACES (TURF OR ASPHALT). WHERE MULCH MOUND IS ADJACENT ASPHALT PAVING INSTALL ROLLED ASPHALT EDGING AS PER DETAIL 3.01 (ASPHALT/MULCH INTERFACE).
4. MULCH MOUND TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.



SECTION

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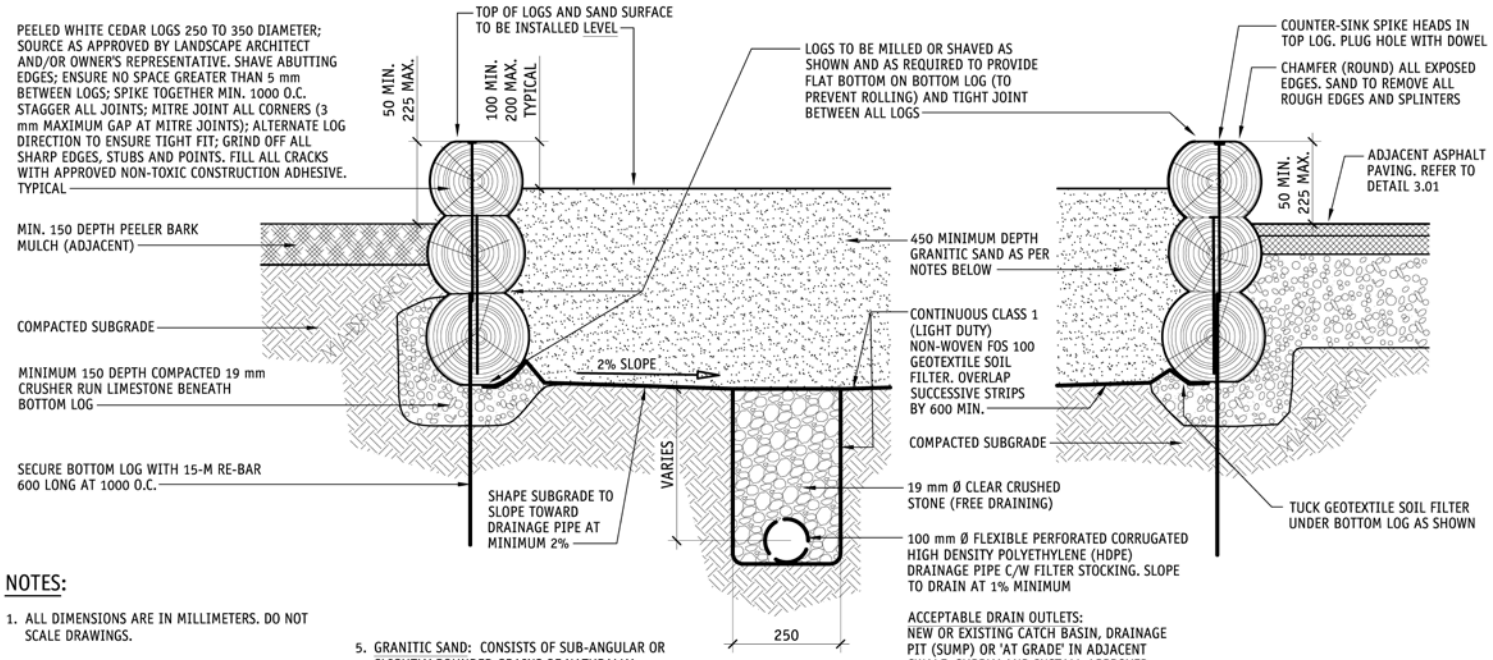
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Mulch Mound	DETAIL # 4.01



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH, SAND AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULARS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL LOGS TO BE WHITE CEDAR, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS, FREE FROM WARPS, CHECKS AND CRACKS.
4. ALL SPIKES, NAILS AND OTHER FASTENERS TO BE GALVANIZED.
5. GRANITIC SAND: CONSISTS OF SUB-ANGULAR OR SLIGHTLY ROUNDED GRAINS OF NATURALLY WEATHERED GRANITIC SAND. WASHED TO REMOVE ALL ORGANICS, SILT AND CLAY CONTAMINANTS; WITH A pH OF 5.8 TO 6.2; AND CONSISTING OF 80% TO 92% COARSE/MEDIUM SAND WITH PARTICLE DIAMETER OF 0.25 TO 1.0 mm.
6. SAND PLAY AND TIMBER EDGING INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

SECTION

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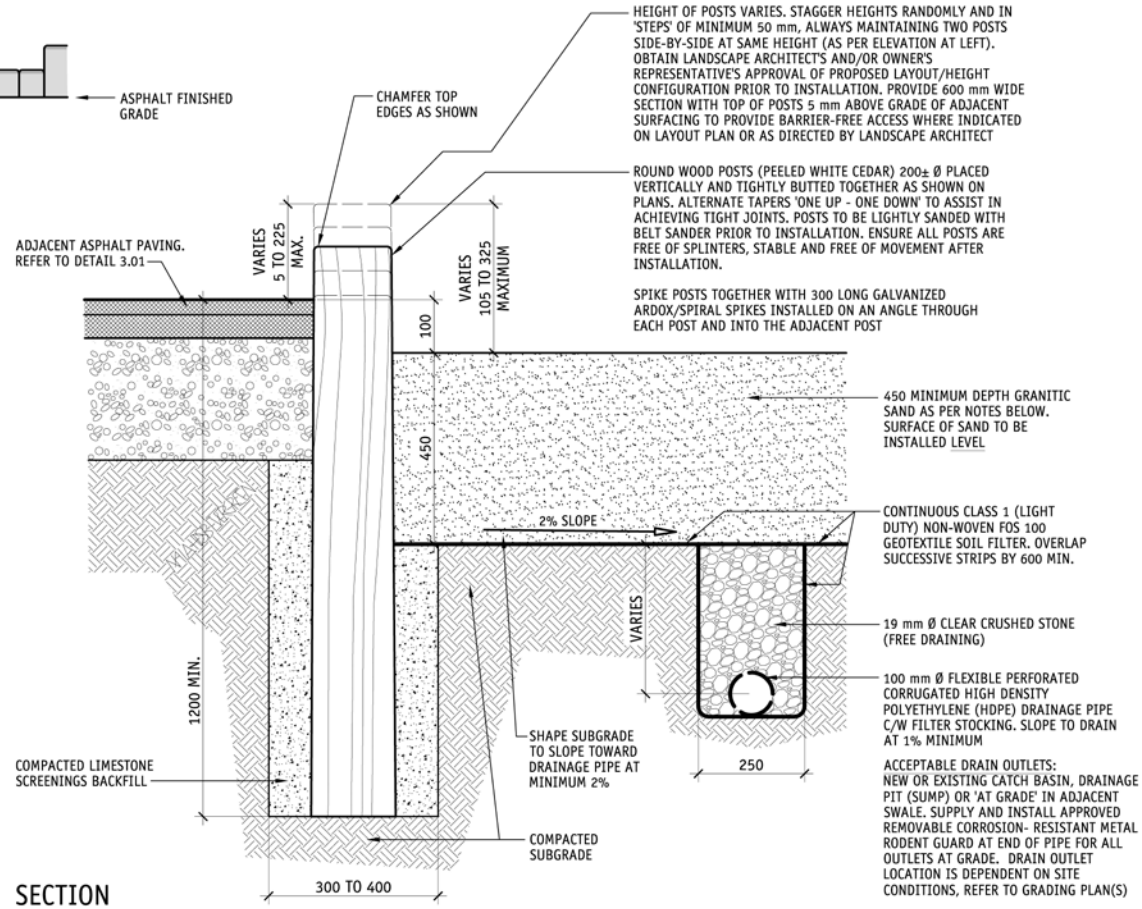
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Sand Play - Rough Timber Edging	DETAIL # 5.01

ELEVATION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH, SAND AND TOPSOIL ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS, GRANULARS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL LOGS TO BE WHITE CEDAR, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS, FREE FROM WARPS, CHECKS AND CRACKS.
4. ALL SPIKES, NAILS AND OTHER FASTENERS TO BE GALVANIZED.
5. GRANITIC SAND: CONSISTS OF SUB-ANGULAR OR SLIGHTLY ROUNDED GRAINS OF NATURALLY WEATHERED GRANITIC SAND. WASHED TO REMOVE ALL ORGANICS, SILT AND CLAY CONTAMINANTS; WITH A pH OF 5.8 TO 6.2; AND CONSISTING OF 80% TO 92% COARSE/MEDIUM SAND WITH PARTICLE DIAMETER OF 0.25 TO 1.0 mm.
6. SAND PLAY AND CEDAR POST EDGING INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.



SECTION

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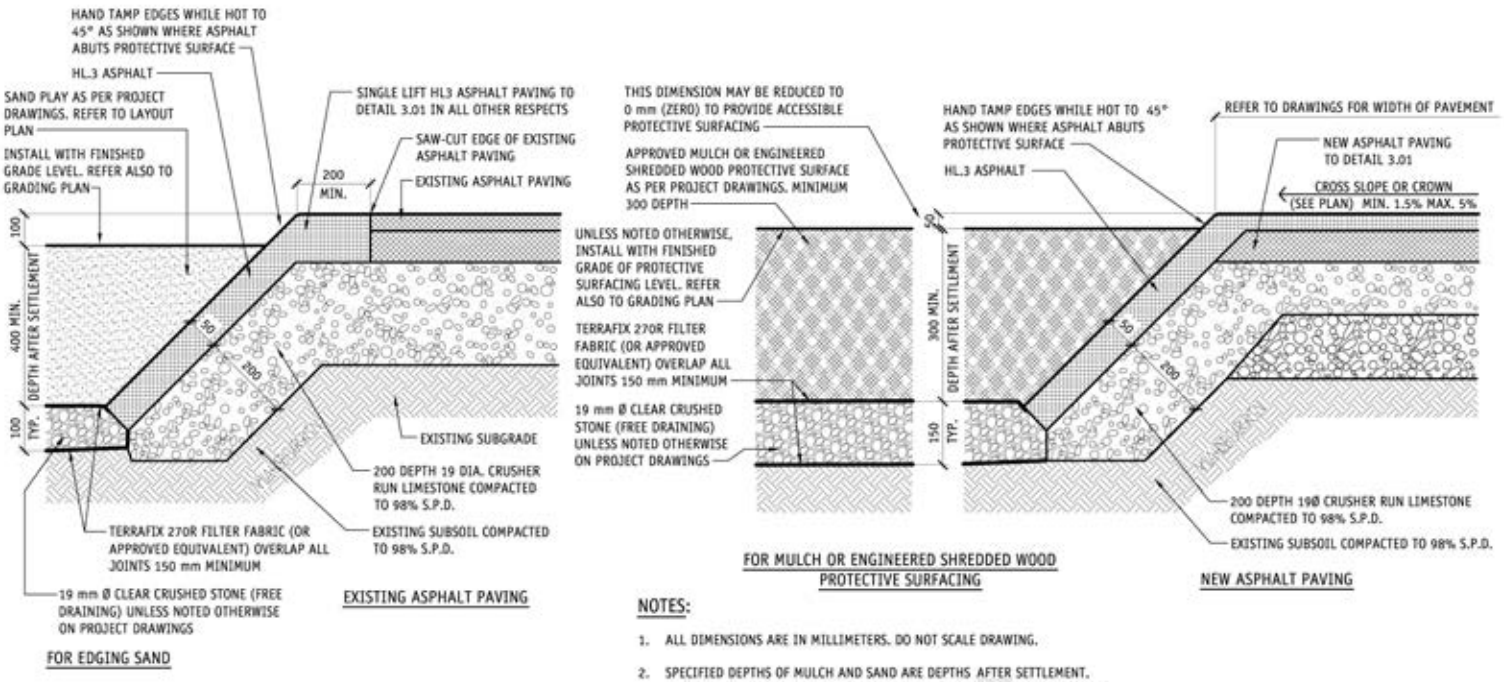
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Sand Play - Cedar Post Edging	DETAIL # 5.02



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH AND SAND ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF ASPHALT AND GRANULAR BASES IS COMPACTED DEPTH.
3. HL8 AND HL3 ASPHALT TO BE COMPACTED TO 92% - 96% MRD.
4. EXISTING GRANULAR BASES ON SITE MAY BE REUSED AS NEW GRANULAR BASE FOR NEW PAVING INSTALLATIONS, PROVIDED THAT MATERIAL IS CLEAN AND THAT NEW BASE IS INSTALLED AS PER DETAIL(S).
5. ASPHALT PAVING AND EDGING TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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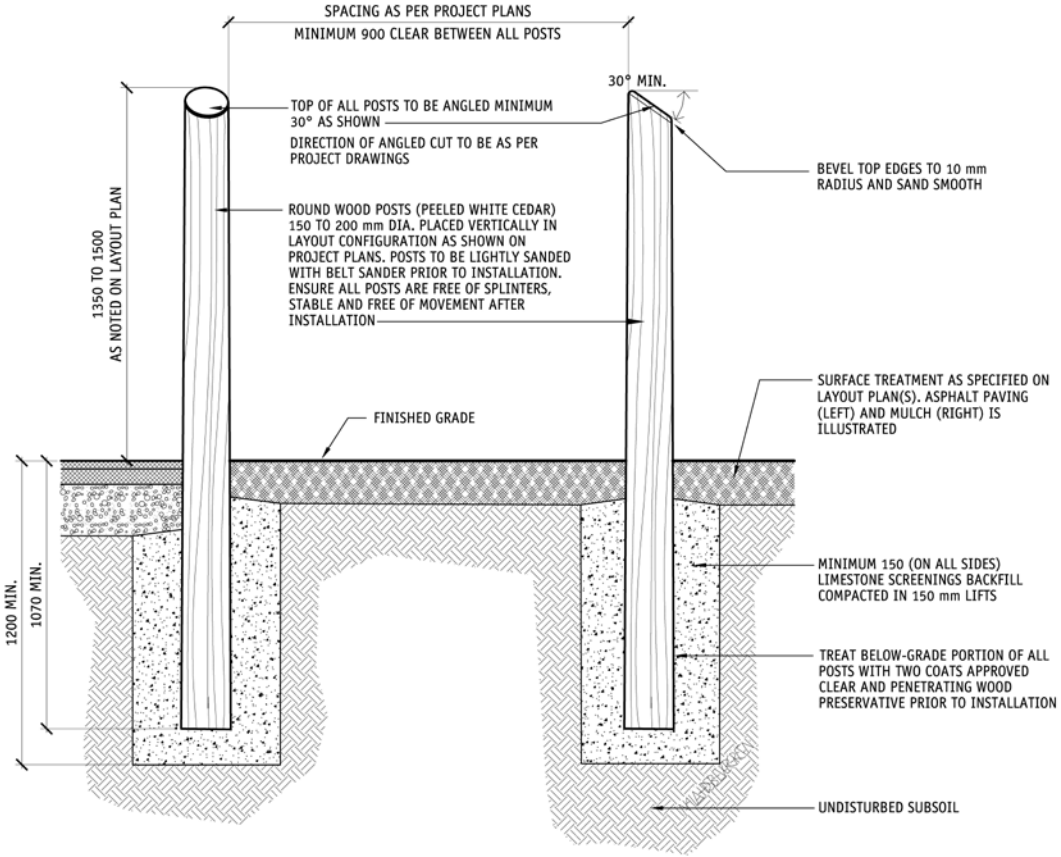
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Rolled Asphalt Edging - for Protective Surfacing and Sand Play	DETAIL # 5.03



SECTION

POSTS ILLUSTRATED ON THIS DETAIL ARE APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL POSTS TO BE INSTALLED VERTICAL. VARY HEIGHTS AS INDICATED ON LAYOUT PLAN(S).
4. NUMBER OF POSTS VARIES. REFER TO PROJECT DRAWINGS FOR TOTAL QUANTITY.
5. ALL WOOD TO BE WHITE CEDAR, ROUND POSTS, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS, FREE FROM WARPS, CHECKS AND CRACKS.
6. PLAY POST INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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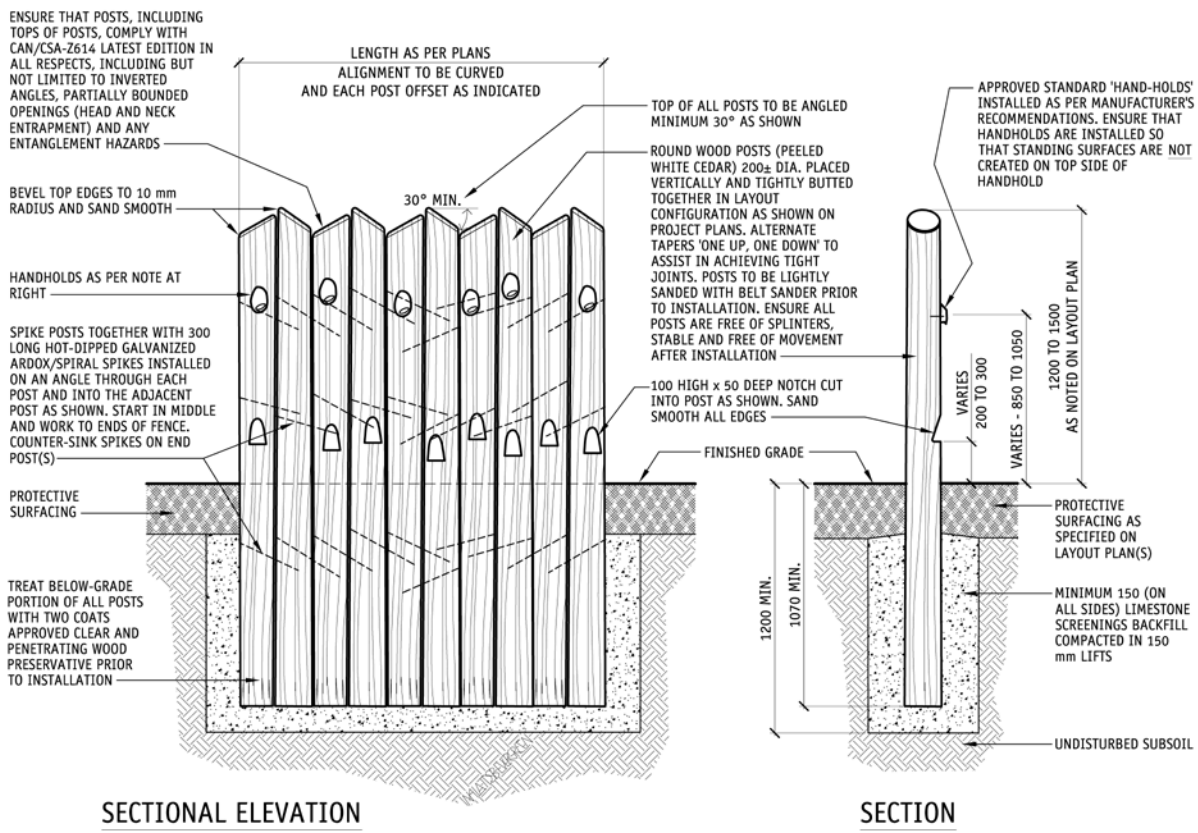
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Play Posts	DETAIL # 6.01



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL POSTS TO BE INSTALLED VERTICAL. VARY HEIGHTS OF POSTS AS INDICATED ON LAYOUT PLAN(S).
4. ALL WOOD TO BE WHITE CEDAR, ROUND POSTS, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS, FREE FROM WARPS, CHECKS AND CRACKS.
5. ALL BOLTS, NAILS AND OTHER FASTENERS TO BE GALVANIZED.
6. PALISADE POSTS WITH NOTCHES AND HANDHOLDS TO BE INSTALLED TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.
7. FINAL INSTALLATION TO BE INSPECTED BY A CANADIAN CERTIFIED PLAYGROUND INSPECTOR AND REGISTERED PLAYGROUND PRACTITIONER FOR FULL COMPLIANCE WITH CAN/CSA-Z614 LATEST EDITION.

POSTS ILLUSTRATED ON THIS DETAIL ARE APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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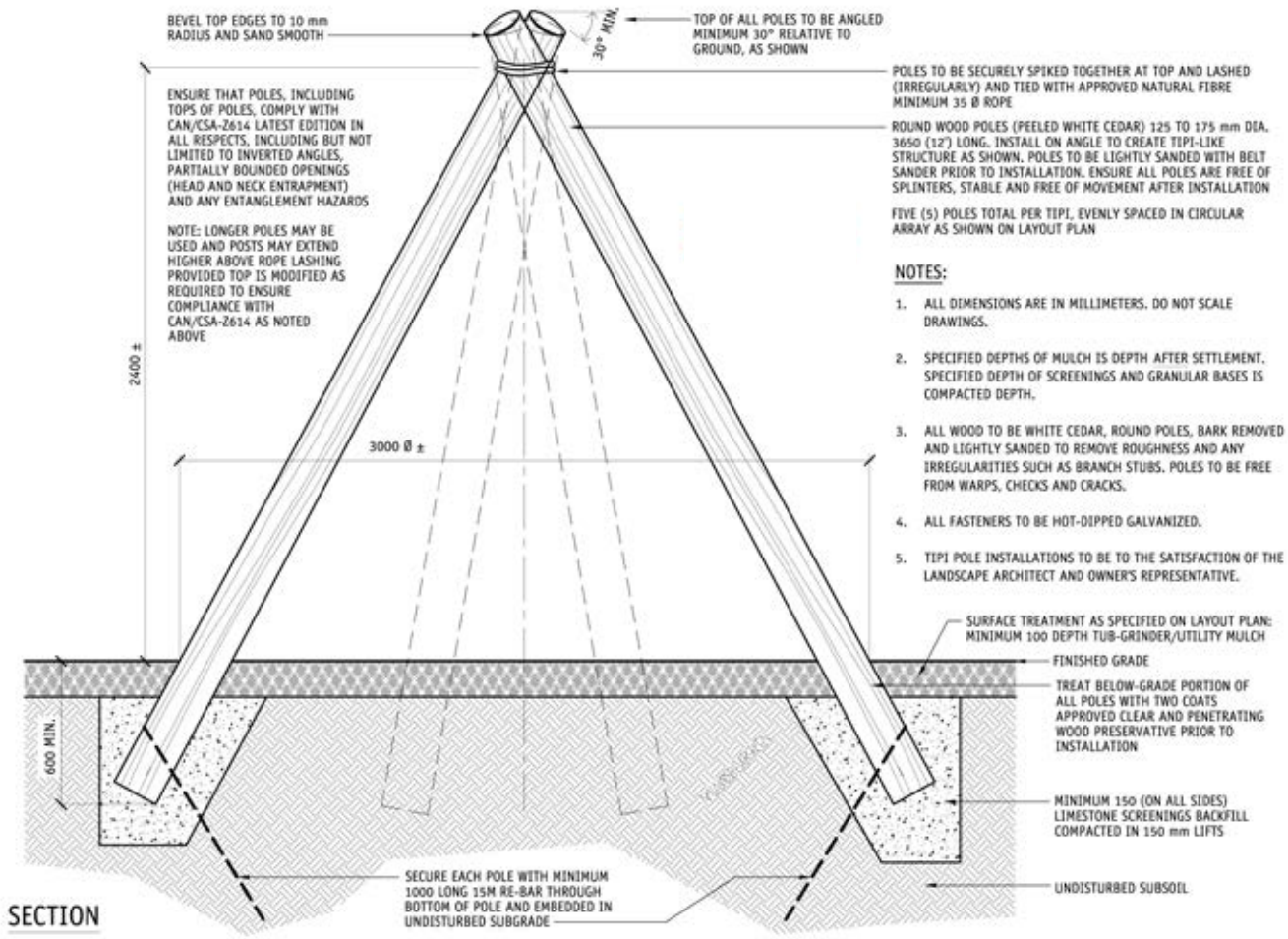
WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

Palisade Posts - with Notches and Handholds

DETAIL # 6.02



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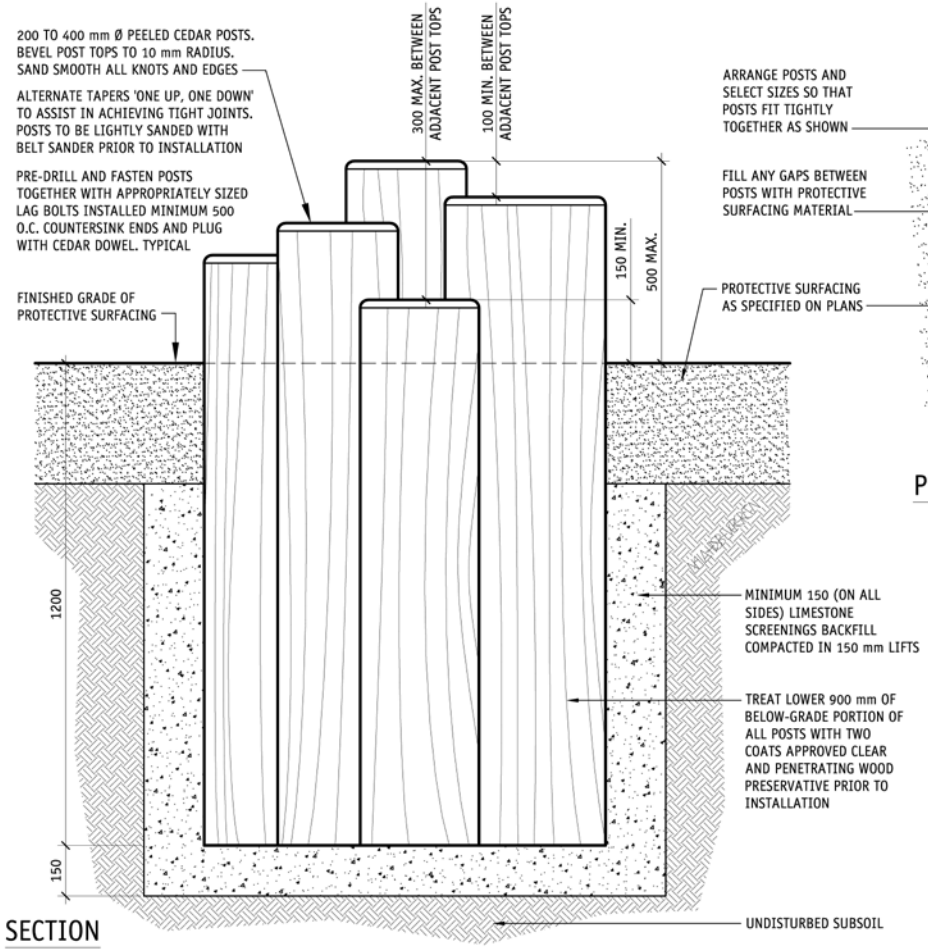
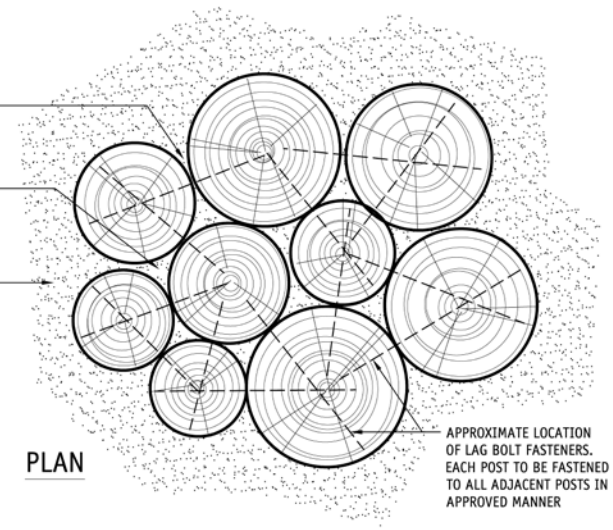
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN Imagine your city with nature	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Tipi Poles	DETAIL # 6.03





NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTH OF PROTECTIVE SURFACING IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF LIMESTONE SCREENINGS IS DEPTH AFTER COMPACTION.
3. ALL POSTS TO BE INSTALLED VERTICAL AND WITH TOPS CUT HORIZONTAL. VARY HEIGHTS AS INDICATED ON LAYOUT PLAN(S).
4. NUMBER OF POSTS VARIES. REFER TO PROJECT DRAWINGS FOR TOTAL QUANTITY AND/OR OUTSIDE DIMENSIONS OF CLUSTER OF STEPPED POSTS.
5. ALL WOOD TO BE EASTERN WHITE CEDAR AND IS TO BE PEELED (BARK REMOVED) AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS. ALL POSTS TO BE FREE FROM WARPS, CHECKS, CRACKS AND SPLINTERS.
6. ALL FASTENERS TO BE HOT-DIPPED GALVANIZED.
7. STEPPED POSTS INSTALLATION TO COMPLY WITH CAN/CSA-Z614, LATEST EDITION.
8. STEPPED POSTS INSTALLATION TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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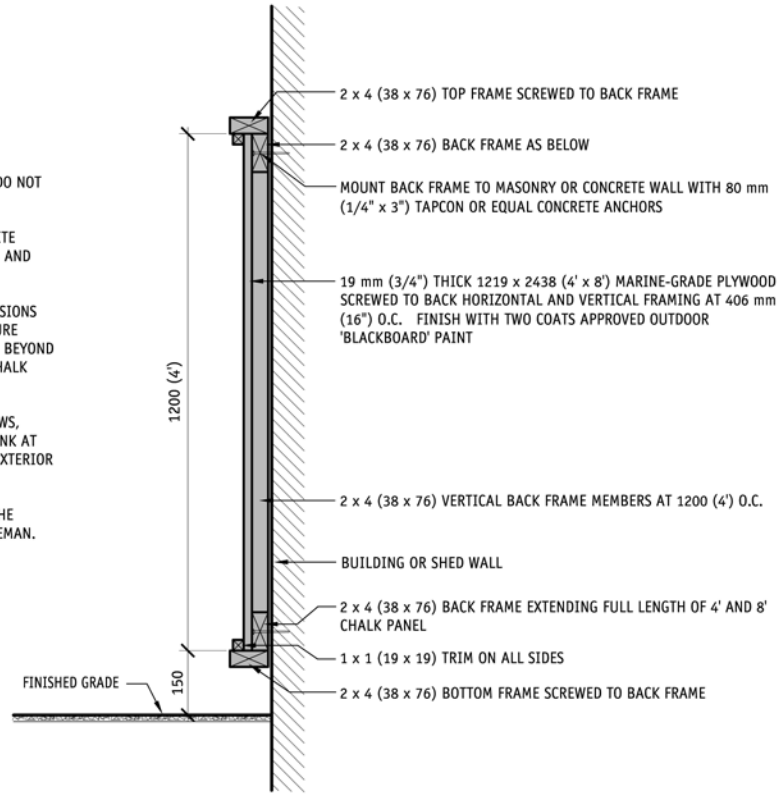
WATERLOO REGION DISTRICT SCHOOL BOARD	EVERGREEN	northwood	SCHOOL GROUND STANDARD CONSTRUCTION DETAILS	Stepped Posts - Kindergarten	DETAIL # 6.04

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. ALL FRAMING WOOD TO BE EASTERN WHITE CEDAR FREE OF WARPS, CHECKS, CRACKS AND SPLINTERS. UNFINISHED.
3. PRIOR TO INSTALLATION, ADJUST DIMENSIONS OF CHALK PANEL, AS REQUIRED, TO ENSURE THAT BUILDING OR SHED WALL EXTENDS BEYOND PANEL BY MINIMUM 50 mm. INSTALL CHALK PANEL LEVEL AND 'SQUARE'.
4. ALL FASTENERS TO BE GALVANIZED SCREWS, SIZED APPROPRIATELY AND COUNTER-SUNK AT SURFACE. FILL ALL SCREW HOLES WITH EXTERIOR GRADE WOOD FILLER
5. CHALK PANEL INSTALLATION TO BE TO THE SATISFACTION OF THE WRDSB SITES FOREMAN.



SECTION

INSTALLATION HEIGHT OF CHALK PANEL ILLUSTRATED ON THIS DETAIL IS APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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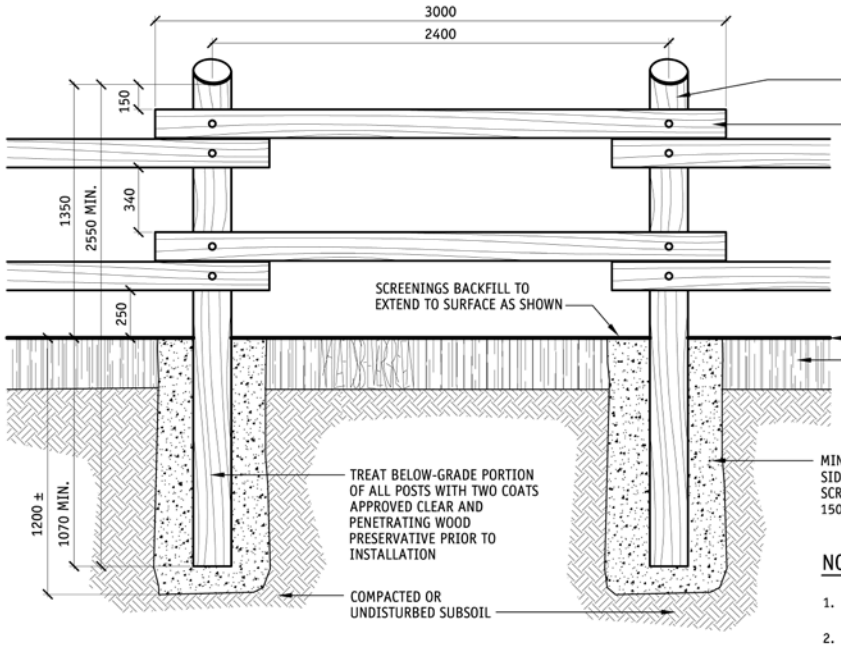
WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

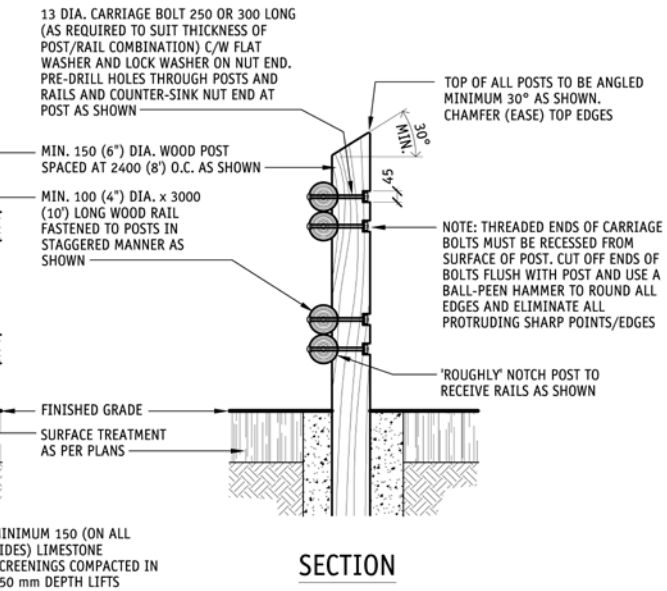
SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

Chalk Panel

DETAIL # 6.05



SECTIONAL ELEVATION



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF TOPSOIL IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL RAILS TO BE INSTALLED LEVEL. STEP FENCE AT POSTS, AS REQUIRED TO SUIT NEW FINISHED GRADES.
4. ALL WOOD TO BE WHITE CEDAR, ROUND POSTS AND RAILS, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS), FREE FROM WARPS, CHECKS AND CRACKS.
5. ALL BOLTS, NAILS AND OTHER FASTENERS TO BE GALVANIZED.
6. WOOD RAIL FENCE INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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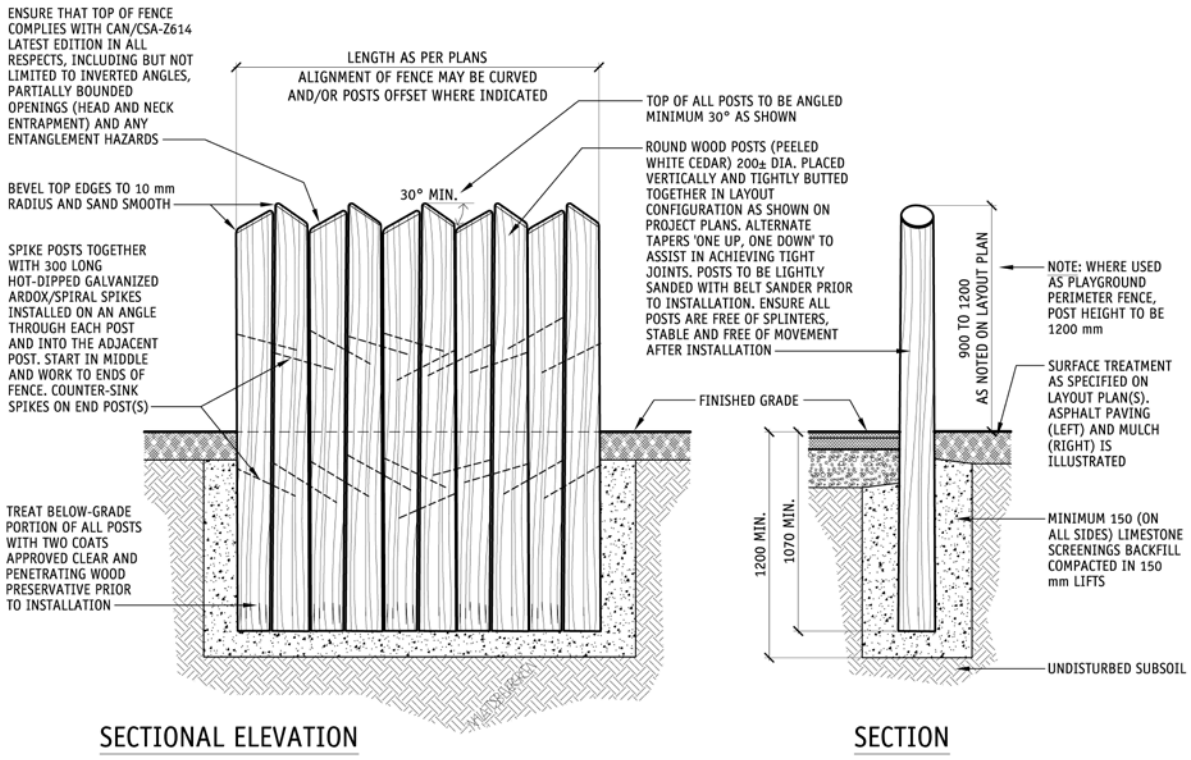
WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

Wood Rail Fence

DETAIL # 7.01



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH AND TOPSOIL IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL POSTS TO BE INSTALLED VERTICAL. STEP TOP OF FENCE AS REQUIRED TO SUIT NEW FINISHED GRADES.
4. ALL WOOD TO BE WHITE CEDAR, ROUND POSTS, BARK REMOVED AND SKINNED/TURNED TO REMOVE IRREGULARITIES SUCH AS BRANCH STUBS, FREE FROM WARPS, CHECKS AND CRACKS.
5. ALL BOLTS, NAILS AND OTHER FASTENERS TO BE GALVANIZED.
6. PALISADE POST FENCE INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE.

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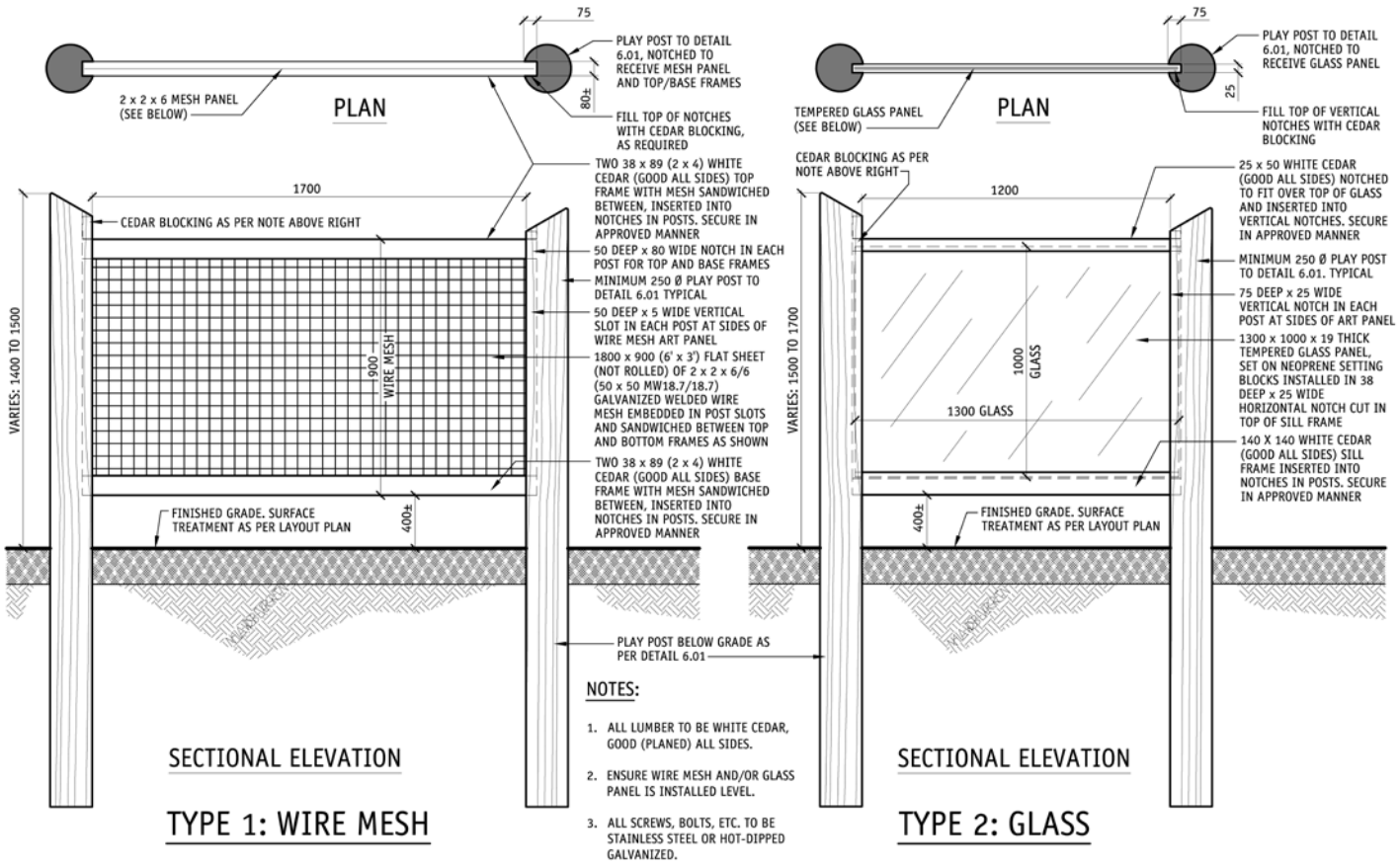
WATERLOO REGION DISTRICT SCHOOL BOARD | EVERGREEN | northwood

SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

Palisade Post Fence

DETAIL # 7.02



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APPENDIX A:

Watering Guidelines for Newly Planted Trees

Trees love water! So much so that from May to August each tree needs 30 gallons of water every week. From September to mid-October, each tree needs 30 gallons of water every two weeks.

Trees must be watered throughout the summer. When students come back to school in September, continue this practice through to mid-October. This will ensure the trees have enough water going into the harsh winter months.

The Bucket Method

Why the bucket method?

- It conserves water.
- It offers an easy way to measure how much water trees are receiving.
- It is efficient for trees that are within reach of a garden hose and planted fairly close together; the way we like them!
- It reuses your school's five-gallon buckets from floor cleaners etc.
- There is no cost to the green team since the pails are readily available.
- The technology is simple.
- Students can adopt this practice as part of their tree stewardship program.
- The system is simple, fun for students and can easily be taken on by clubs or classes.
- [It offers a teachable opportunity to discuss water conservation and tree stewardship.

Where can you get your buckets?

Ask your school's Head Custodian to save empty five-gallon containers for re-use. Be sure to clean the containers thoroughly before you use them. You will need one five-gallon pail for each tree. Have someone drill two quarter-inch holes in the bottom of the pails to allow for slow flow.

How does the bucket method work?

1. For a grove of six trees, start with six buckets.
2. Place one bucket at the drip line of each tree.
3. Fill each pail with water using a hose. It will take about two minutes to fill the pail with a regular garden hose (water will leak out the bottom as the pail is filling up).
4. It takes five minutes for the pail to empty, so over the course of six minutes (four minutes to fill plus two to empty) ten to eleven gallons of water percolates slowly into the soil (there should be very little runoff).
5. Continue to fill all the buckets one at a time.
6. When you have finished filling the last bucket, return to the first tree and move the first pail one-third of the way around the same tree and fill it up again. Repeat with the other buckets and the other trees.

7. Repeat the process for a third time, moving the pails another one-third of the way around the trees and filling them up one final time. You should fill each tree's pail three times in total so that the tree will receive approximately 30 gallons of water.
8. If water starts to run all over the ground rather than sinking in, be patient. The soil may not be accepting water due to extreme drought.
9. Do this weekly from May to August and every two weeks from September to mid-October.

Tree Watering Bag Method

Why the water bag method?

- It conserves water.
- Bags hold 20 gallons of water.
- It offers an easy way to measure how much water trees are receiving.

Where can you get your tree watering bag?

The school's Head Custodian can purchase the tree watering bag from local retailers and online.

How does the tree watering bag method work?

1. Lift the label and insert your hose into the slot.
2. Fill the bag until full.
3. While the bag fills, give the bag a few shakes to ensure the drainage holes are not plugged.

APPENDIX B:

Criteria for Acceptable Nursery Stock

a) Trees shall be the size and variety noted on the Recommended Plant List (See Appendix H). Plant material that does not have the specified root ball diameter as mentioned in plant list will be rejected.

b) All nursery stock supplied shall be Canadian nursery grown, of the species and sizes indicated on the drawings.

c) Any nursery stock dug from native stands, wood lots, orchards or neglected nurseries and which have not received proper cultural maintenance as advocated by the Canadian Nursery Landscape Association shall be designated as "collected plants." The use of "collected plants" will not be permitted unless approved by the WRDSB Foreperson Sites & Fleets.

d) The WRDSB Foreperson Sites & Fleets reserves the right to inspect the plant material at their original source, and to instruct the supplier on root and branch pruning requirements.

e) Plants larger than specified may be used if approved by the WRDSB Foreperson Sites & Fleets.

f) All nursery stock shall be measured when the branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch tip.

g) Where trees are measured by calliper, reference is made to the diameter of the trunk, measured 300mm above ground as the tree stands in the nursery.

h) All nursery stock shall be well branched, true to type, structurally sound, possess a well-developed, undamaged root system and shall be free of disease, insect infestations, rodent damage, sunscald, frost cracks and other abrasion or scare to the bark. All parts of the nursery stock shall be moist and show live, green cambium when cut.

i) All trees shall have one only, sturdy, reasonably straight and vertical trunk and a well-balanced crown with fully developed leader. All evergreens shall be symmetrically grown and branched from ground level up, and must be balled and burlapped unless noted otherwise on the plant list. At least one plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant

j) All nursery stock shall be well protected from damage and drying out from the time of digging until the time of planting on site. All roots shall be cleanly cut; split roots are not acceptable.

k) Nursery stock shall be transplanted with care to prevent damage. Points of contact with equipment shall be padded. All nursery stock, which cannot be planted immediately upon arrival at the site, shall be well protected to prevent drying out and shall be kept moist until commencement of planting.

APPENDIX C:

The Importance of Mulch

Why do we mulch?

Spreading mulch around the base of trees and in gardens offers students a hands-on opportunity to learn about, and participate in, caring for trees, shrubs and other plants.

Students and Stewardship

For many years, students have been planting gardens on their school grounds and in local parks. While new projects are exciting, students can learn a lot about environmental stewardship by caring for existing trees and gardens

Allergy Alert!

Make sure that parents of students allergic to dust and mould are aware of the activity and take the precautions they recommend.

How does mulch help our trees, shrubs and plants?

- Keeps roots cool.
- Retains moisture.
- Protects roots from foot traffic.
- Protects trunk from lawn care equipment.
- Reduces erosion and soil compaction.
- Prevents water runoff.
- Improves the organic content of the soil.
- Absorbs excess moisture in spring and fall and extends the mud-free pavement zone, giving students more room to play.
- Keeps weeds down.

How much mulch do I need?

- Use the side table to calculate how much mulch you need.
- Mulch is ordered in cubic yards. (Note: the landscape industry does not often deal in metric units).
- The formula for volume is: V = Length x Width x Depth.
- If you measure and calculate volume in feet, divide your result by 27 to determine the number of cubic yards, since there are 27 cubic feet in one cubic yard (27 ft3 = 1 yd3).
- If you measure and calculate volume in metres, multiply your result by 1.3 to determine the number of cubic yards, since there are 1.3 cubic yards in 1 cubic metre (1 m3 = 1.3 yd3).

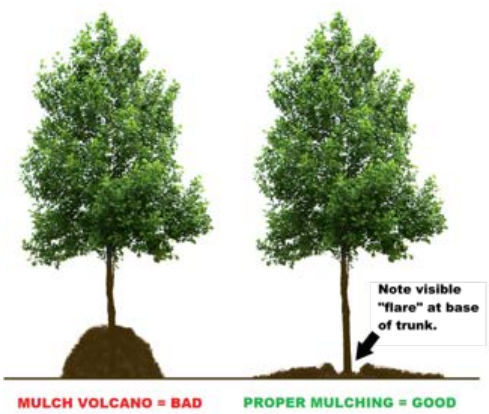
Trees and shrubs:

Recommended Depth - spread mulch 15 cm deep

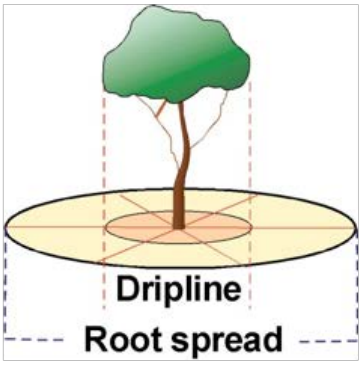
	Volume of Mulch	NOTES
Newly planted trees	½ cubic yard (about 13 milk crates)	Spread approximately 1m out from the base in a circle
Existing trees	1–4 cubic yards (depending on size and # of trees)	Spread to the drip line to ensure you are protecting the tree's root system (see diagram on reverse)
Trees in planter boxes	½ -1 cubic yard	Depending on depth of box (mulch to the top edge of box)
Shrubs	¼ cubic yard each (about 6.5 milk crates)	Spread approximately 1m out from the base
Pathways, outdoor classrooms, muddy areas	1 cubic yard	This will cover about 54 square feet of area (3 ft x 18 ft, or 2 ft x 27 ft)

- For Garden beds, spread mulch to a depth of 4" (100mm).

Newly Planted Trees



Existing Trees



Trees in Planter Boxes

APPENDIX D:
Loose Parts Play

Here are some ideas for loose parts play components that will animate your outdoor space and inspire creativity.

- Containers: milk crates, buckets, tubs, baskets
- Gardening equipment: Wheel barrows, carts, gloves, tools, watering cans
- Natural materials: twigs, leaves, grass, pine cones, seeds, beans, bark, feathers, moss, drift wood, flowers, straw, mulch
- Cardboard boxes and tubes
- Pieces of rain gutter, bamboo troughs
- Construction materials: building blocks, log rounds, sand, stones, small pieces of lumber, shells, cedar poles
- Plastic ABS pipe with numerous connector pieces
- Dirt, mud, cob, sand and water
- Sisal or coconut mats, sheets, blankets, canvas, tarps
- Traffic cones
- Rocks (too big to throw, but not too big to roll)
- Ropes, hoops, tubes, balls
- Fabrics for temporary partition or covering
- Plastic or metal plates, cups, bowls, funnels, sponges, spoons, pots and pans
- Brooms, rakes, shovels

APPENDIX E:

Recommended Plant List

TREES IN HARD SURFACE
Trees planted in paved areas, permeable rubber surfaces or raised planters made of armour stone, precast concrete or timber.

CONIFEROUS TREES IN HARD SURFACES
(250—300cm tall)

- White Spruce (Picea glauca)

DECIDUOUS TREES IN HARD SURFACES
(75mm caliper)

- Honey Locust (Gleditsia triacanthos var. inermis)
- Silver Maple (Acer saccharinum)
- Freeman Maple (Acer freemani)
- Hackberry (Celtis occidenetalis)

DECIDUOUS TREES IN SOFT SURFACES
(75mm caliper)

- Tulip Tree* (Liriodendron tulipifera)
- Honey Locust (Gleditsia triacanthos var. inermis)
- Kentucky Coffee Tree (Gymnocladus dioicus)
- Silver Maple* (Acer saccharinum)
- Red Maple* (Acer rubrum)
- Sugar Maple* (Acer saccharum)
- Freeman Maple* (Acer freeman)
- Black Maple* (Acer nigrum)
- Red Oak* (Quercus rubra)
- White Oak* (Quercus alba)
- Bur Oak (Quercus macrocarpa)
- Swamp White Oak (Quercus bicolor)
- Yellowwood (Cladrastis lutea)
- Hackberry* (Celtis occidentalis)
- Basswood* (Tilia americana)
- Ironwood (Ostrya virginiana)
- Sweetgum (Liquidambar styraciflua)
- Accolade Elm** (Ulmus x accolade)
- American Sycamore (Platanus occidentalis)
- London Plane** (Platanus x acerifolia)
- Horse Chestnut** (Aesculus hippocastanum)
- Northern Catalpa** (Catalpa speciose)

TREES AND SHRUBS IN SOFT SURFACE
Trees planted in islands, medians, bio-retention areas and other consolidated planting areas. Soft surface provide better growing conditions and suitable for both trees and plants.

DECIDUOUS TREES IN GROVES IN SOFT SURFACES
(75mm caliper)
Use a variety of trees to improve biodiversity and to integrate with curriculum goals. For example, you can plant 8 trees in a circle with armour stone seating to form a shaded outdoor classroom. Same list as Deciduous Trees in Soft Surfaces (See list above).

CONIFEROUS TREES IN GROVES IN SOFT SURFACES
(250—300cm tall)
Plant 3, 6, or 8 of the same species; space them at 3 - 4m apart)

- White Spruce (Picea glauca)
- White Cedar (Thuja occidentalis)
- White Pine (Pinus strobus)
- Hemlock (Tsuga Canadensis)
- Larch (Larix laricina)

LARGE SHRUBS PLANTED AS SINGLES OR IN GROVES
(200—250cm tall)

- Downey Serviceberry (Amelanchier arborea)
- Shadblow Serviceberry (Amelanchier canadensis)
- Nannyberry (Viburnum lentago)
- Alternate-leaved Dogwood (Cornus alternifolia)
- Redbud (Cercis canadensis)
- Gray Dogwood (Cornus racemosa)
- Ninebark (Physocarpus opulifolius)

* Best Shade Trees – refers to sun-blocking ability of the tree. For more details see: http://chd.region.waterloo.on.ca/en/healthyLivingHealthProtection/Shade-Matters.asp

** Introduced Species (not native to Waterloo Region, but not invasive)

Design Guidelines for K-12 Outdoor Play and Learning Environments