



**EVERGREEN**  
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# Landscape and *Child* Development

**A Design Guide for Early Years–Kindergarten Play-Learning Environments**



**Second Edition 2013**

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# Executive Summary

This guide has been written to give design professionals, educators, construction staff, and school communities a common set of ideas and practical details for discussing, planning, and realizing outdoor early years–kindergarten play environments that connect children to nature.

These guidelines for outdoor learning and play environments represent design ideas that incorporate green design principles and that are centred on meeting children’s developmental needs—physical, cognitive, social, and emotional.

In an era of climate change, and with the current generation of children being less active and spending more time than ever indoors, efforts to entice children and their teachers to spend more time in engaging, child-centred, green-designed school grounds is very timely. Everyone benefits from a well-designed playground—perhaps none more than our youngest students.

The guidelines do not cover the full scope of work on school grounds. Rather, they describe a new design approach that draws on knowledge of how physical space and natural features can stimulate healthy early child development. While these design parameters represent a departure from practices at the Toronto District School Board (TDSB), the content has been assembled based on designs and practices that have already been successfully implemented at many TDSB schools.

This second edition has been updated, with more images, diagrams, and design ideas that illustrate a clear connection between the quality of the landscape and its effect on learning. We have also made references to the Ontario Ministry of Education’s draft document *The Full-Day Early Learning–Kindergarten Program, 2010–11*. The intent is to support a collaborative effort among designers, principals, educators, parents, and students in designing spaces in the playground that pique children’s natural curiosity and lead to rich inquiry- and play-based learning.

These guidelines capture the experience of many years of playground planning, design, and construction work at the TDSB, and they draw upon the lessons learned from Evergreen’s fifteen years of transforming Canadian school grounds into diverse, nature-filled learning environments. This work continues to evolve as we research and try out new ideas to bring nature to school grounds.



## Introduction

# Childhood *Is* Changing

*Think back to when  
you were a child.*

Does the rule “You can go out and play with your friends after dinner but be home when the street lights come on” sound familiar? Today’s world is very different. Children no longer freely explore the world around them, and many have extremely limited ranges—maybe they are not permitted to wander beyond their driveways or the hallways in their apartment buildings. Fear for child safety, over structured routines, and time spent on electronic media are some of the main inhibitors to outdoor discovery. What will the impact of these changes be on this and future generations of young people? It’s time to get kids outside again.



# Healing the Nature Deficit: A Call to Action



Richard Louv, a journalist and author of *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder*, has stimulated an international conversation about the relationship between children and nature. In this influential work about the staggering divide between children and the outdoors, Louv links the lack of nature in the lives of today's wired generation—he calls it nature deficit—to some of the most concerning childhood trends, such as the rise in obesity, attention disorders, and depression.

Louv's research, along with that of various other health practitioners, social scientists, and educators, compels us to take action in our cities and in our schools to bring the outdoor experience back into children's lives. The challenge is to negotiate space for young people in the larger urban fabric of parks, streetscapes, and neighborhoods and begin to create networks of vibrant and safe places for children to do what comes naturally—PLAY! The richer the network for play environments, the more opportunities children have to build their self esteem, confidence, resilience, perseverance, and creativity—all attributes of healthy child development (Louv).

*School grounds can be a safe and exciting place to play that's close to home for most children. As an extension of the classroom, the school grounds can be used in varied ways for formal and informal learning activities. There is untapped potential for these spaces to be vibrant landscapes for play and learning, where children can explore nature on a daily basis.*



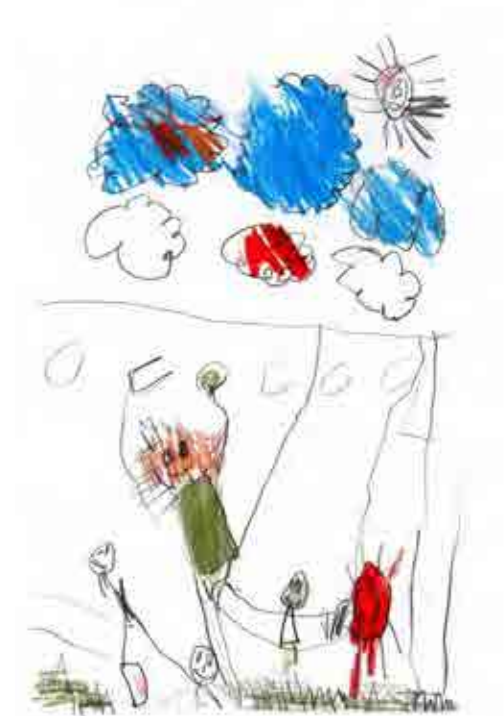
# The Importance of Play

A report from The American Academy of Pediatrics titled "The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds" expounds on the importance of play to the healthy development of children.

The report states that play is so important to optimal child development that it has been recognized by the United Nations High Commission for Human Rights as a right of every child. The report goes on to say:

*Play allows children to use their creativity while developing their imagination, dexterity, and physical, cognitive, and emotional strength. Play is important to healthy brain development. It is through play that children at a very early age engage and interact in the world around them. Play allows children to create and explore a world they can master, conquering their fears while practicing adult roles, sometimes in conjunction with other children or adult caregivers. As they master their world, play helps children develop new competen-*

*cies that lead to enhanced confidence and the resiliency they will need to face future challenges. Undirected play allows children to learn how to work in groups, to share, to negotiate, to resolve conflicts, and to learn self-advocacy skills. When play is allowed to be child driven, children practice decision-making skills, move at their own pace, discover their own areas of interest, and ultimately engage fully in the passions they wish to pursue. Ideally, much of play involves adults, but when play is controlled by adults, children acquiesce to adult rules and concerns and lose some of the benefits play offers them, particularly in developing creativity, leadership, and group skills. In contrast to passive entertainment, play builds active, healthy bodies. In fact, it has been suggested that encouraging unstructured play may be an exceptional way to increase physical activity levels in children, which is one important strategy in the resolution of the obesity epidemic. Perhaps above all, play is a simple joy that is a cherished part of childhood. (Ginsburg 182)*



Chapter **1**

# Play–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

# Landscapes That Teach



Children love the natural world. An outdoor space that is rich in natural features can powerfully stimulate their sense of wonder and discovery (Cobb). Where do ants live? Why do leaves change colour? What does a snowflake taste like? The outdoors is unique in how it engages young children in their learning (Wilson). Many skills that educators set out to teach formally and help children to develop are achieved naturally in the outdoor environment. Current research

makes it clear that our earliest experiences—the way we play, learn, and interact with the world around us as young children—have a profound and formative effect on our health, thinking, and behaviour throughout our lives (Gopnik).

From a very early age, children are curious about nature. By closely exploring their own outdoor space they begin to develop a broader sense of connection to the world beyond their playground.

“ Built environments have their own hidden curriculum that teaches us as effectively as any course taught in them. ”

– David W. Orr, Buildings That Teach

Natural features play a central role in creating rich and stimulating outdoor experiences. But improving an early years–kindergarten site means going beyond simply planting trees, shrubs, and wildflowers. Good design that balances natural and built features is essential to realizing a playground’s potential. To create a landscape that nurtures early childhood development we recommend integrating the following goals:

- safeguard and improve children’s health and well-being
- increase the diversity of natural features and play opportunities
- enhance the use of the outdoors for inquiry- and play-based learning

These goals may be similar to those your school community already aims to achieve. Together, they express a vision that is particularly important in today’s urban environment, in which the experience of childhood is changing rapidly and young children have limited opportunities to connect with nature.



# Principles *For Planning* *Play-Learning* Environments



**I**t is important to remember that for safety reasons early year-kindergarten children are often segregated from the rest of the students in a fenced-off area of the school ground, limiting their hands-on experiences to a smaller area for play. It is therefore essential that these areas are designed in ways that provide daily access to nature, support children's natural curiosity, inspire creativity, and incorporate a number of opportunities for healthy development and play-based learning.

## *What principles inform processes for designing early years–kindergarten play–learning environments?*

When planning a new play space, these suggestions will be helpful in exploring ideas and creating landscapes that are meaningful, practical, sustainable, and achievable. Here’s what Evergreen and the Toronto District School Board recommend:

- Meet children’s developmental needs—physical, social, cognitive and emotional.
- Get people involved—adopt a participatory approach.
- Appeal to children’s senses—establish a code of aesthetics.
- Make spaces safe and accessible.
- Support inquiry- and play-based learning.
- Meet staff needs and plan for maintenance.

Each of these principles is outlined in the following pages.

“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*



# Meet Children's Developmental Needs

*When developing an approach to designing early childhood spaces, it is important to step back from the adult's perspective and notice what children actually do.*

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 to apply these experiences as we design children's spaces today. Using these categories, design professionals and educators can plan the play space to support learning experiences that strongly connect with curricular outcomes at all the developmental stages (Sobel).

## Adventure

Children are built for adventure—climbing, balancing, jumping, swinging. They thrive on physical challenge, anticipation, and mystery. Adventure implies that you don't fully know what's going to happen when you start out. Early years–kindergarten spaces need to feed children's natural curiosity and thirst for adventure through careful planning and design.

Consider the importance of risk and challenge in the landscape; children test their limits through play, and they repeat skills in order to master them—climbing onto a rock, navigating a corduroy bridge, balancing on a log (Shackell et al). Risk is a powerful catalyst for growth—it helps children develop good judgment, persistence, courage, resiliency, and self-confidence (Finch).

## 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 trees. Build rich environments that facilitate storytelling and dramatic play. Set the stage for children to imagine themselves in many different roles.

## Animal Allies

Children love animals. They want to connect to the animal world and experience encounters with animals. Facilitate the interaction

between children and animals—provide opportunities in the landscape that support the observation and exploration of animals and their habitats in natural settings and that facilitate creative play and children’s desire to become a particular animal or insect. Nurturing children’s connection to animals and helping them to learn how to care for them responsibly contributes to their development.

## 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 example, they might move through a backyard and excitedly declare that they have discovered a secret trail or short-cut. For this reason, hold back on designing every square inch of a play space. Allow children to devise their own trails, paths, and “desire lines.”

## Special Places

Children want to hide, retreat, and find places for refuge. Design a space that incorporates hiding-places and fort building and provides

children with loose parts (such as sticks, brush, rope, and log pieces) to build their own dens and bush huts. Such design allows a child to build his or her own private place.

## Small Worlds

Children role play real-life situations through imagining scenarios and building small worlds. Plants, sand, and soil are materials that small children can relate to and manipulate for building and creating their own small worlds.

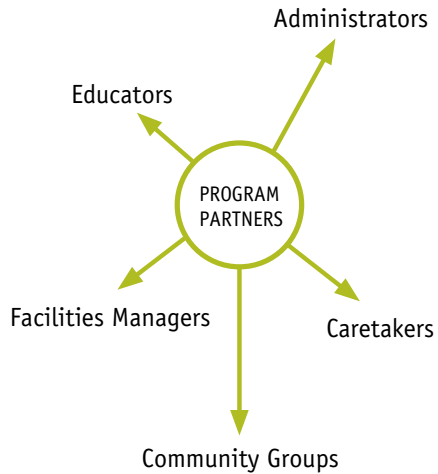
## Hunting and Gathering

Children love 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. When exposed to natural spaces, children are inclined to collect bugs, leaves, rocks, and sticks. A space that offers a variety of natural materials, surfaces, and textures provides an environment where children can search for patterns in nature, which involves inquiry-based learning.



See the Design Framework in Chapter 2 for design features that heighten children’s sense of adventure and offer children opportunities to engage in nature play and safe risk-taking.

## Get People Involved



Six fundamental principles guide the Full-Day Early Learning–Kindergarten program. One of these key principles is: “Partnerships with families and communities strengthen the ability of early childhood settings to meet the needs of young children.” In addition to involving educators, administrators, caretakers, and facilities managers in the design process, it’s important to involve individuals and relevant community groups who have an interest in changes to the play space.

A participatory process involves working together in a spirit of mutual respect and acknowledging that each person brings something of value to the initiative. It is about collectively creating a vision, to determine a plan and carrying it out.

(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/>)

## 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 the senses in a positive way, including hearing, feeling, smelling, and tasting. For example, the aesthetics of architectural design affect the senses through proportion, scale, rhythm, light, materials, odours, and colours. Some ideas for the school ground include displaying children’s project work, and their creative expression through works of art. Build a welcoming, sensory filled meet-and-greet area, plan a scented garden, and use art along fences as unique expressions that reflect the culture of the school community.



**SeeHearSmellTasteTouch**

## Make Spaces Safe and Accessible

Safety and security are the first priorities for early years—kindergarten play spaces. Adhering to the TDSB Safe School Policy is the first step toward that goal. All TDSB early years—kindergarten play spaces must comply with the latest version of CAN/CSA-Z614-07. Trees planted in the right locations optimize clear sight lines. Greening the playground transforms it from predominantly hard surface play spaces to softer, less severe environments.

The design of the early years—kindergarten play space must ensure that children of varying physical abilities have access to all major play spaces. Accessibility to different ground levels (through ramping, for example) could be considered and developed as a play opportunity in itself, rather than serving only a functional purpose. The early years—kindergarten play space should be a terrain of play opportunities for all children.

## Support Inquiry- and Play-based Learning

A landscape that offers a diversity of natural spaces can be a rich environment for inquiry- and play-based learning. Here are some ideas:

- Incorporate gardens and habitat areas rich with a diversity of trees, shrubs and wildflowers.
- Create a vegetable garden to improve food literacy.
- Provide a variety of natural elements, loose parts, and materials.
- Support children’s inquiry by including learning materials such as hand lenses and items for recording observations (pencils, paper, crayons, cameras).
- Build on the existing instructional uses of the site.
- Work with staff to expand the learning opportunities outdoors.

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

Go to Evergreen’s Teacher’s Corner for lesson plan ideas: <http://www.evergreen.ca/en/resources/schools/teachers>



## Don't Forget Loose Parts!

Early childhood educators recognize play as the foundation activity for almost all future learning. Loose parts play is an important part of this learning continuum. Found objects such as balls, hoops, wooden blocks, costumes, hockey sticks, logs, sand, and leaves provide opportunity for more kinds of play than occurs with standard play equipment. Children can experiment with their physical and creative abilities by manipulating found loose objects.



## Meet Staff Needs and Plan For Maintenance

Meeting the needs of staff in the kindergarten play environment is essential to the success of the space. 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 an 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 manipulated by the children and staff.
- Keep maintenance in mind as you plan for a diversity of play spaces and loose-parts integration. A diverse play environ-

ment with many play 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.



## Landscapes That Inform

- 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 oak and armour stone.
- Pay attention to transitions between

adjacent materials, such as having log edging next to the sand play area and a mulch trail.

- 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.

How we design our school grounds has a direct influence on children's attitudes and behaviours. Every play space should reveal an identity and purpose, and be rich in potential to engage and to communicate. In the design itself, embed messages that signal:

- a child-centred approach
- principles of sustainability
- the health of the local ecology
- the uniqueness of the community

It is essential to design play spaces that encourage encounters, communication, and relationships and that reveal an underlying order and beauty in the design and organization of all the features and materials within it (Cadwell).



# *Key Design* Considerations For *Play-Learning Environments*



The success of a natural space can be measured in many ways, but one effective way is to observe and listen to what the children are doing and saying when they are outdoors. The following key design elements will help you to create a landscape that supports rich and authentic hands-on learning experiences that inspire children to ask questions such as “How do trees grow?”

During the design phase, include the following five ingredients in your recipe for a high-impact play-learning environment.

## Key Ingredients

- 1 *a diversity of spaces*
- 2 *multi-purpose elements*
- 3 *loose parts*
- 4 *community presence*
- 5 *seasonal presence*



## ***What qualities do diverse landscapes offer?***

### **Flexibility**

Design spaces should be suggestive, not prescriptive. Flexibility of use is important!

### **Playfulness**

Get creative with colour, pattern and texture to increase the aesthetics and playfulness in any space.

### **Graduated Challenges**

Provide graduated levels of safe risk-taking for different ages, stages and abilities. These help children build their self-esteem and confidence. For example, by offering several levels of accomplishment for each activity—high, higher, highest—children can test their abilities, develop better decision-making skills and nurture their confidence: “I can do this!”

### **Scale**

Design elements should be scaled for the child, and aim for creating a sense of intimacy. When determining locations of play areas, take advantage of the spatial quality, sense of place and shade created by existing trees.

Moore, Goltsman - *Play for All Guidelines*

# 5 ingredients in your recipe for high-impact play-learning environments

## A Diversity of Spaces

Encourage diversity by creating different spaces within the play space. Create landmarks that function as distinct meeting spaces, and places for children to play. Avoid mass repetition of the same feature in order to increase the quality of the landscape.

- Provide lots of loose parts to provoke imaginative play and to stimulate creative thinking.
- Plan a nature study area (let an area of grass grow or plant an area of wildflowers to attract butterflies).

## Multi-purpose Elements

The elements and spaces of an exemplary early years—kindergarten learning and play space serve many purposes. Designing and choosing elements that can be used and interpreted in many ways is more challenging to a child’s imagination than single-purpose “pieces.”

- Incorporate elements that serve many purposes (e.g., a flat-topped stone in the sand play area can be used as seating or a table top).
- Mold the landscape in interesting ways and use vegetation to create rooms, arbors, and nooks (e.g., low hills, and tunnels made by planting Serviceberry shrubs on either side of a pathway to create a beautiful allée).

## Loose Parts

Adding props to play settings should be encouraged and accounted for in budgeting.

- Incorporate child-sized furnishings.
- Provide a variety of garden tools, child-sized wheelbarrows, and watering devices.
- Always have hand-held lenses, bug nets and catchers, digging tools, and observation and field note materials nearby (pencils, cameras, crayons, journals, paper) to stimulate children’s natural curiosity.
- Offer easy access to creative accessories (e.g., costumes, props, puppets).
- Provide loose parts (i.e., any assortment of found objects and natural materials



that children can move and manipulate during their play, which can be added and rotated daily, weekly or monthly to vary children's outdoor play).

- Display loose parts around the play-learning space to encourage creative play.
- Regularly assess the materials for sharp edges or hazards, and replenish materials as they get used up or worn out.

## Community Presence— Ecological and Cultural

Respond to local ecology and community. Design to suit the site's ecological setting and its particular uses such as an outdoor seating area, and the characteristics of the school community. Early years–kindergarten play spaces offer children and their communities a rich terrain of play opportunities and social gathering spaces that evoke response to their natural surroundings.

## Seasonal Potential

Design for year-round use. Exemplary early years–kindergarten play spaces designed for year-round use will highlight the wonderful opportunities presented by seasonal and perennial gardens, ice sculpting, and snow-fort making. Tree planting and natural play spaces are major components in optimizing the seasonal potential of playgrounds. In addition to the colours, smells, textures, and visual changes that mark the seasons, a play space of leaves is like a playground of snow—an engaging and delightful raw material for play. Sun and rain shelters and natural wind-breaks accommodate teaching outdoors and help to extend classroom time outside. The use of evergreen trees provides winter interest and attracts wildlife.



# Chapter 2

## Design Framework



“ 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”

# *Landscapes* That Nurture Child Development



**V**ibrant play-learning environments reflect a child-centred approach and respond to children’s innate desire to participate in shaping their surroundings. Combining features such as sand, water, hills, construction areas, and sheltered gathering spaces challenge children’s bodies, test their skills, foster negotiation, co-creation, and the sharing of stories. This chapter offers a design framework to help you to explore options and develop new ideas for your play-learning environment.

“ 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

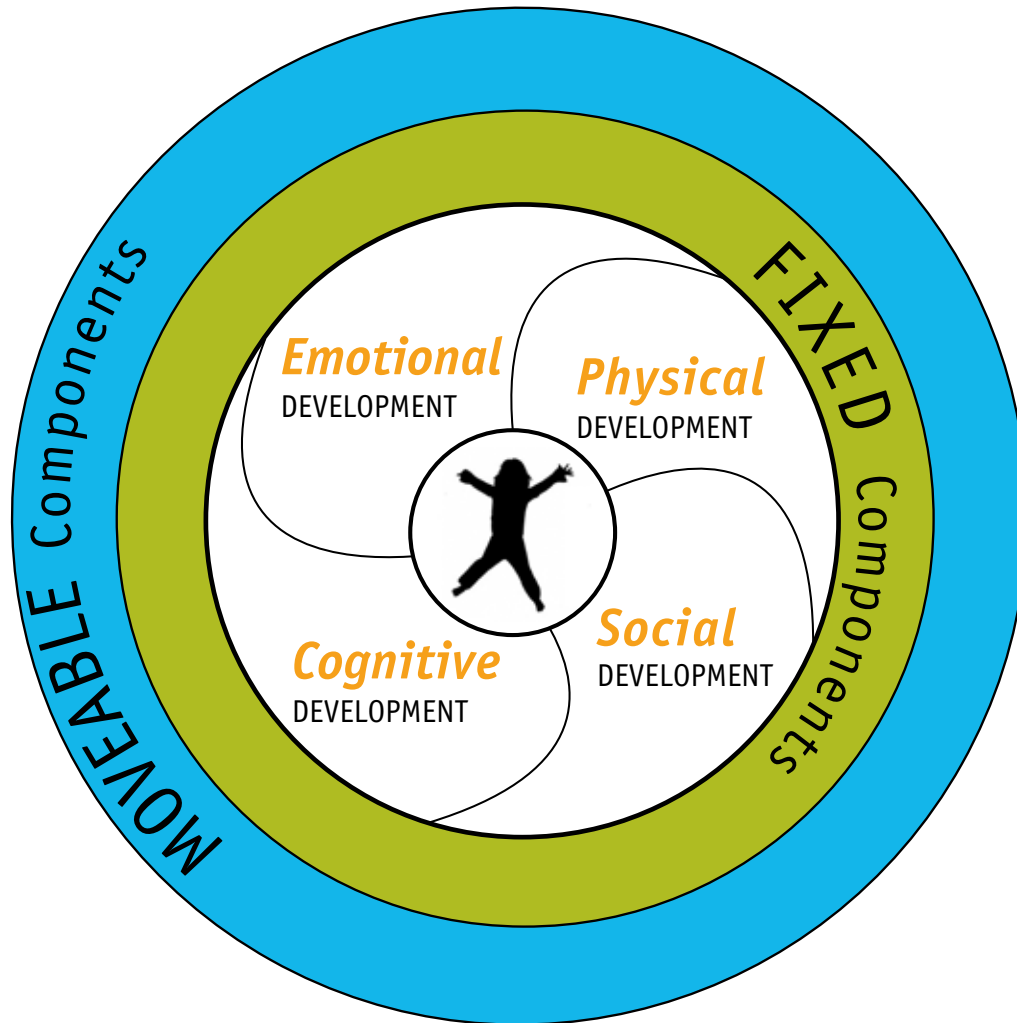


*What does a vibrant early years–kindergarten play–learning environment look and feel like?*

Welcoming, open, beautiful,  
Leafy, soft, colorful, green,  
Child-size, spongy, rough, bumpy,  
smooth, natural, fresh, alive,  
Slimy, cool, sheltered, shady, messy,  
mushy, rolling, exciting,  
Layered, textured, cared for, safe,  
cozy, warm, friendly, inviting.

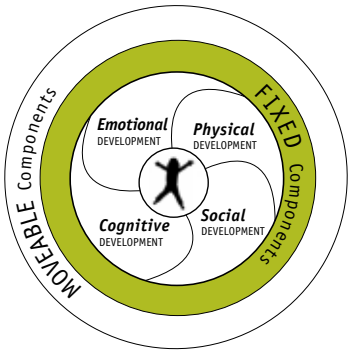
# Play-Learning Environment *Design* Framework

The Play-Learning Environment Design Framework is a tool for focusing and organizing design thinking about early years–kindergarten play–learning environments. The Framework links children’s developmental needs—physical, social, emotional and cognitive—to the choices and arrangement of both the fixed and movable components of your design. Central to the framework’s utility is the understanding that any distinct space on your grounds is likely to have both fixed and movable components and be serving a range of developmental needs. Multiple possibilities and benefits in both the whole and its components is the goal.



*The fixed and moveable components of the design work together in service of the range of development needs of the child.*

*This framework is intended to act as a filter for design thinking from concept through to implementation.*

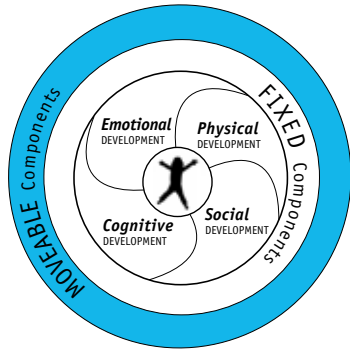


# Fixed Components

Fixed landscape components are the anchor points of a landscape—for example, trails, groves of trees, hills, and rock circles. Read through the framework on the next pages and think about what might ignite a child’s natural curiosity and sense of wonder. Arrange these components thoughtfully, to prioritize connectivity, maintain flexibility and create a kind of “loose fit” that allows educators and children to play an active role in adding moveable components to customize their play–learning environment. Consider these questions: What do you want to be able to do in the play space that supports play-based learning? How might you create adventure, mystery, physical challenge, and opportunities for social interaction? Reflect back on David Sobel’s seven play motifs in Chapter 1, and ask yourself what messages you want to send to children about your own values about learning.

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





# Moveable Components

The framework includes a menu of moveable components that can be incorporated into the play space. Use different combinations of these to animate an integrated outdoor learning environment that is informed by a number of teaching practices that are inclusive of, but not limited to, emergent learning, inquiry and play-based learning. 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 (See Appendix E for a list of loose parts for the outdoors).

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 children to connect directly with nature.

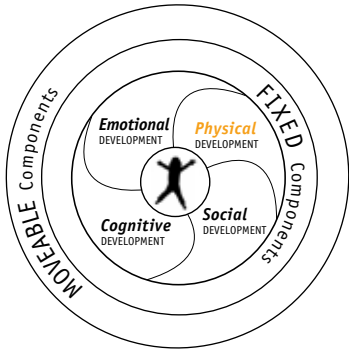


## *What is an integrated learning environment?*

An integrated outdoor learning environment – takes a holistic approach to design, is responsive to the local environment (natural and built) and inclusive of children's developmental needs, educators pedagogical goals, and the uniqueness of the school community.

**Emergent learning** – an interactive style of instruction that is collaborative, where the teacher and children seek out answers together. Emergent curriculum is based on the premise that children are most successful at learning when curriculum experiences account for their interests, strengths, needs, and lived realities (Early Learning Centre, University of Toronto, OISE).

**Play-based learning through inquiry**– play is a vehicle for learning and lies at the core of innovation and creativity This approach builds on children's spontaneous desire for exploration with guidance from the educator to become more focused and systematic in their observations and investigations (Ministry of Education – Full Day Early Learning--Kindergarten Program Draft).



# Physical Development

*Outdoor play develops motor skills, physical stamina and confidence while promoting fitness and health.*



## Children need to:

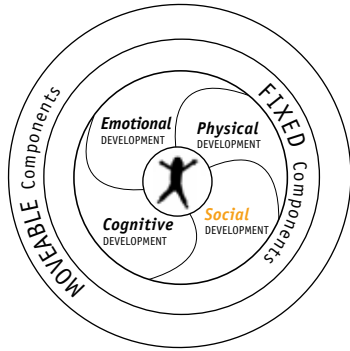
move climb dig roll run jump leap ride hop  
 skip balance hang grasp cling swing lift push  
 pull fall down stretch stack carry pour

## What are the *fixed* components of a play-learning environment that supports physical development?

- A variety of surfaces integrated into a dynamic topography offers children a context for creativity and a wonderful sensory experience as well as a way for them to discover their agility and nurture motor skills
- Open areas with flat spaces, mounds, and hills
- Hard and soft surface areas
- Areas for loose materials - sand, mulch, soil,
- Space for balancing or jumping from different heights
- Groves of trees for playing hide and seek and winding trails for building obstacle courses
- Meandering paths of limestone screenings, mulch, or asphalt

## What *moveable* components are used in a play-learning environment that supports physical development?

- Flat topped logs, square logs
- Natural or built elements for climbing
- Climbing walls, climbing poles
- Rumble strips
- Balancing logs, wobbly logs, zigzag logs
- Hanging bars with safety surfacing
- Bridges, decks,
- Flat topped blouders, armour stone, flag stone, stepping stones, tall shrubs, trees
- Buckets, pulleys, rope
- Rock piles, tall shrubs, trees
- Sand piles, mulch mounds, snow
- Dimensional wood, cedar boards for stacking
- Wagons, tricycles, scooters,



# Social Development

*Through play children learn rules, cooperation and sharing. Children learn to use moral reasoning to develop values during play. Children develop strong cultural identity and a sense of self and experience the consequences of their decisions through play.*



## Children need to:

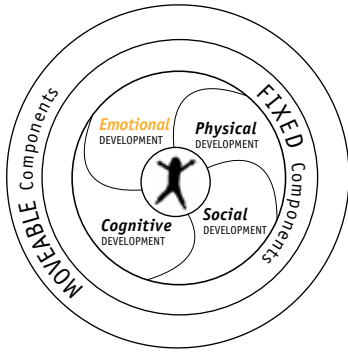
socialize   talk   laugh   share   hang-out together  
 engage in free play   walk and run together   play games  
 negotiate and problem-solve together

## What are the *fixed* components of a play-learning environment that supports social development?

- Trails and pathways
- Shaded areas with seating
- Places for small groups (3-5)
- Spaces for quiet games, eg. checkers on a rock
- Spaces for laying or sitting on grass or mounds
- Shade shelters
- Work areas for cooperative projects
- Groves for treasure hunts or scavenger hunts
- Covered/shaded sand play
- Covered activity areas
- Raised bed gardens with seating
- Outdoor classroom - rock seating circles
- Stages and decks

## What *moveable* components are used in a play-learning environment that supports social development?

- Tree-surround benches, wooden benches
- Mulch or grass mounds, grassy areas
- Zigzag logs
- Play tables
- Bridges
- Stump seats
- Logs, square logs, rocks
- Cedar posts with canvas tarps
- Fabric pieces of different sizes
- Sand and water
- Building materials



# Emotional Development

Through nature play children develop creativity, expression and emotional connectedness. In this way, children learn empathy and responsibility and develop a sensory awareness, and stewardship ethic.



## Children need to:

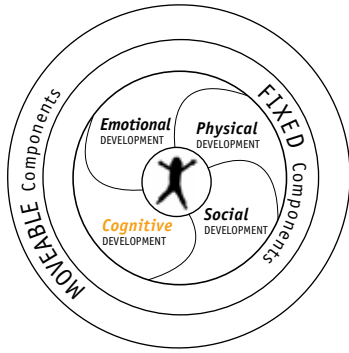
have daily contact with nature • explore natural areas • plant a tree • tend a garden, dig for worms • relax in the shade of a tree • develop an emotional bond with nature • appreciate and care for the environment • collect, find things, pick things up, gather • experience beauty, vegetation changing with the seasons, light, colour, texture

## What are the *fixed* components of a play-learning environment that supports emotional development?

- Nature Study Areas
- Groves of trees and shrubs
- Frog pond
- Wetlands
- Meadows, wildflower gardens
- Storm water bio-swales
- Habitat gardens
- Veggie gardens
- Large sand play area
- Areas of soil and vegetation where children can find ants, snails, worms, caterpillars, spiders
- A variety of plant communities
- Compost pile for collecting bugs
- Spaces for displaying loose parts—seeds, leaves, beachstones, miniature bricks, small glass beads, gravel

## What *moveable* components are used in a play-learning environment that supports emotional development?

- Rotting stumps that can be turned over
- Rain, bird and butterfly gardens
- Bird feeders, bat boxes, toad abodes
- Herb garden
- Locust trees give dappled light
- Scarlet runner beans growing on a bean teepee
- Bug trails and bug hotels
- Cherry tomatoes, bean plants, lettuces
- Annual sunflowers, nasturtiums
- Trees, shrubs, berry bushes, wildflowers edible plants, raspberry bushes, strawberry patch
- Fabric pieces of different sizes
- Worm composting, soil, compost
- Rocks, logs
- Seeds, leaves, buds, needles, pine cones, annual flowers
- Serviceberry with spring flowers, fruit, red autumn leaves
- Golden rod and purple aster



# Cognitive Development

Constructive play develops children's cognitive skills, creativity, perceptual and problem-solving. Fantasy play develops abstract thinking and experiments with language and emotions. Children also develop flexible thinking and imagination through fantasy play.



## Children need to:

be involved in the decisions about their play space • define and evolve their environment, build, create, do, undo, transport, shape and reshape their environment • feel ownership and partnership, make choices and see the possibilities • perch, spy, plan, hide, reveal! • perform and role play • retreat and hide but at the same time see (between branches, from behind the tall grass) • engage in fantasy play • be quiet and observe the world around them • explore, discover, reflect

## What are the *fixed* components of a play-learning environment that supports cognitive development?

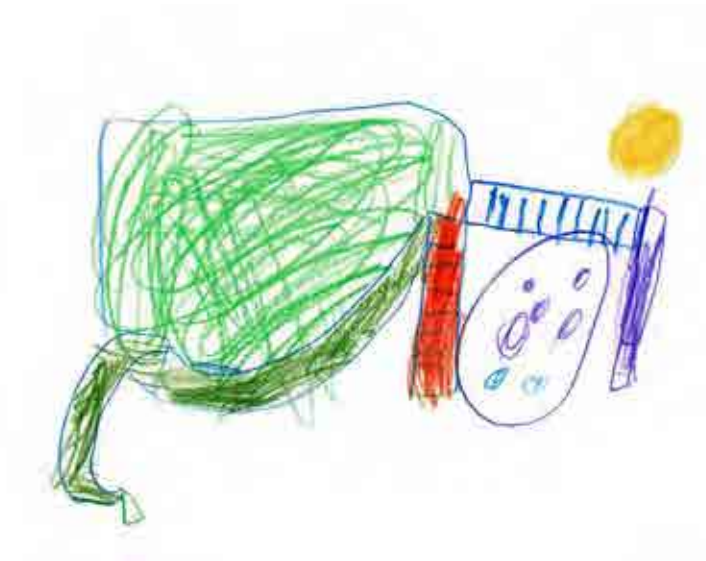
- Construction areas where children can build projects, showcase their work
- 'Art studio' space, creative space
- Spaces for fort and den building, both flat and hilly
- Soil and sand piles, mud pit or spaces for mixing water and clay
- Un-manicured spaces- Nature Study Areas
- A sand and water play area
- Soft landscapes, hills, elevated spaces
- Work Areas
- Soft landscapes – gardens, vegetated areas
- Semi-private spaces, nooks, hide-outs, secret places for 1-2 children
- Gardens with seating
- Groves of tall shrubs and trees (Cedar trees)
- Enclosed spaces and seating areas
- Forts, cedar posts for draping blankets or tarps
- Play house
- Insect trails, paths
- Dramatic play area, staging area
- Music area

## What *moveable* components are used in a play-learning environment that supports cognitive development?

- Activity walls, chalk walls, easels, murals,
- Weaving walls
- Mulch or grass mounds, grassy areas
- Work tables and low decks
- Trees and tall shrubs
- Cedar posts with hooks for hanging fabric
- Activity wall
- Stage - Puppet Theatre
- Fairy gardens, scented gardens
- Square logs, tree cookies for stacking
- Sand, water, soil, mud, straw, mulch
- 4" round cedar poles (short, light weight and moveable)
- Child sized tools—shovels, tarps, rakes
- Buckets, mixing tools and water source
- Child-sized wheelbarrows and sized sawhorses
- Moveable walls – canvas tarps
- Sheets, blankets
- Trees and tall shrubs - Evergreen trees and shrubs
- Cedar posts with canvas tarps
- Dirt, soil and sand for digging
- Tall grasses, tarps and canvas, wood pieces
- Costumes and props
- Dirt, soil and sand for digging
- Chimes, drums, bongos, Amadinda

# Chapter 3

## Key Spaces



“ 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, Goltsman, Play for All Guidelines

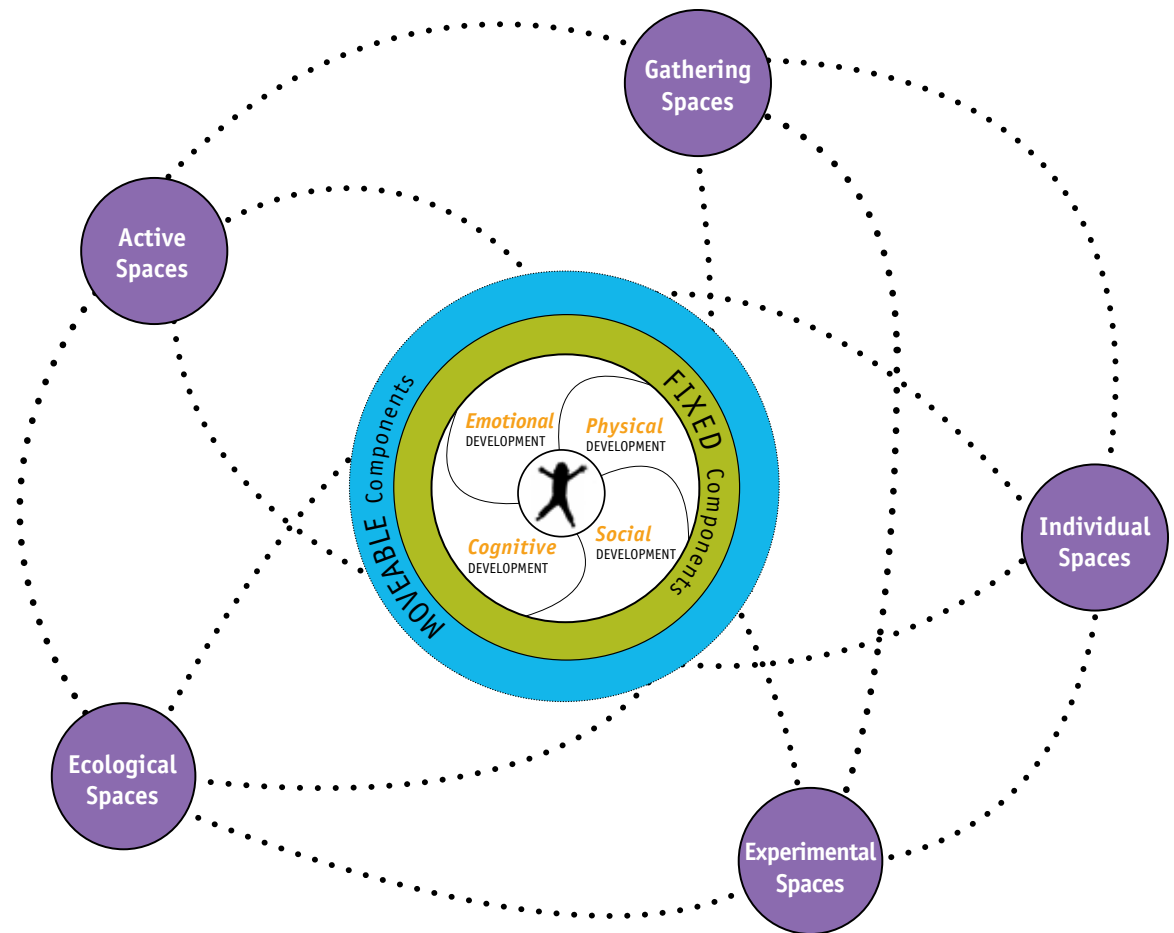
# *Integrating* **Key Spaces** *Into The Design Concept*

**C**reating a conceptual design for your play-learning environment brings all the pieces together—the fixed and moveable landscape components, children’s developmental needs and the desired spatial qualities of your site. Like an inspiring work of art, this palette of ideas must be carefully placed on the canvas. Evergreen and the TDSB suggest priority be placed on five key spaces that should work in concert to create a diversity of play and learning opportunities.

## Key Spaces

Active, Experimental,  
Individual, Gathering,  
and Ecological

As you create your design to include these key spaces refer back to the framework and be conscious of the interplay between the fixed and moveable components within these spaces and how they will invite a wide variety of actions and reactions from children. For clarity, they are explored as distinct spaces, but in practice, it is their relationship to each other that generates the greatest amount and variety of play-learning activity and benefits across all the developmental domains.





## Active Play

Spaces that encourage active play vary in topography, incorporate changes in height, challenge the mind to assess competencies and go beyond perceived limits, develop body awareness in space, and build gross motor skills. These spaces feel energetic; they promote fitness and health.



## Individual

Individual spaces support quiet reflective moments, observation, and listening. They feature small enclaves that are protected, cozy, and enclosed; they feel soft, warm, and safe. This type of space would accommodate one or two children 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 traffic sounds and other loud noises. Some children are sensitive to noise and have a need for a quiet space in the playground.



## Gathering

Gathering spaces can be for a large or small group. These spaces are typically welcoming, fostering of social interaction, and focused on communication, negotiation, and sharing. They offer seating, shade, and should have a balance of soft and hard features. They should be flexible and accommodate multiple uses and users (children, staff, parents), provide a sense of comfort, encourage use and interaction, and function as a stage for planned events or spontaneous creativity.



## Experimental

These are spaces for discovery, exploration, hypothesizing. They are temporary in nature. They are also flexible, alive, messy, and emergent. They should feel more like a lab, a space that supports creativity, constructing, building, testing, and idea-generating. These spaces are often very social, offering opportunities for the development of communication/language skills. They are filled with materials, and have child-sized furnishings and storage. Mud, sand, water, wood, buckets, tools, and other types of loose parts are essential. Educational materials such as hand lenses, clipboards, pencils, and cameras should be used.



## Ecological

Trees, shrubs, and vegetation are strong elements of these spaces. They' are alive, containing ecosystems that attract birds, butterflies, insects, and worms. They offer children access to water, soil, and plants. They create habitat on different scales and will attract a diversity of plant and insect species. They are a real-life demonstration of the cycles in waste, energy, and water. They inspire creative thinking, invite observation, and provoke inquiry. They can look messy and beautiful at the same time. They evoke an emotional response, nurture a sense of responsibility, and offer moments for reflection.

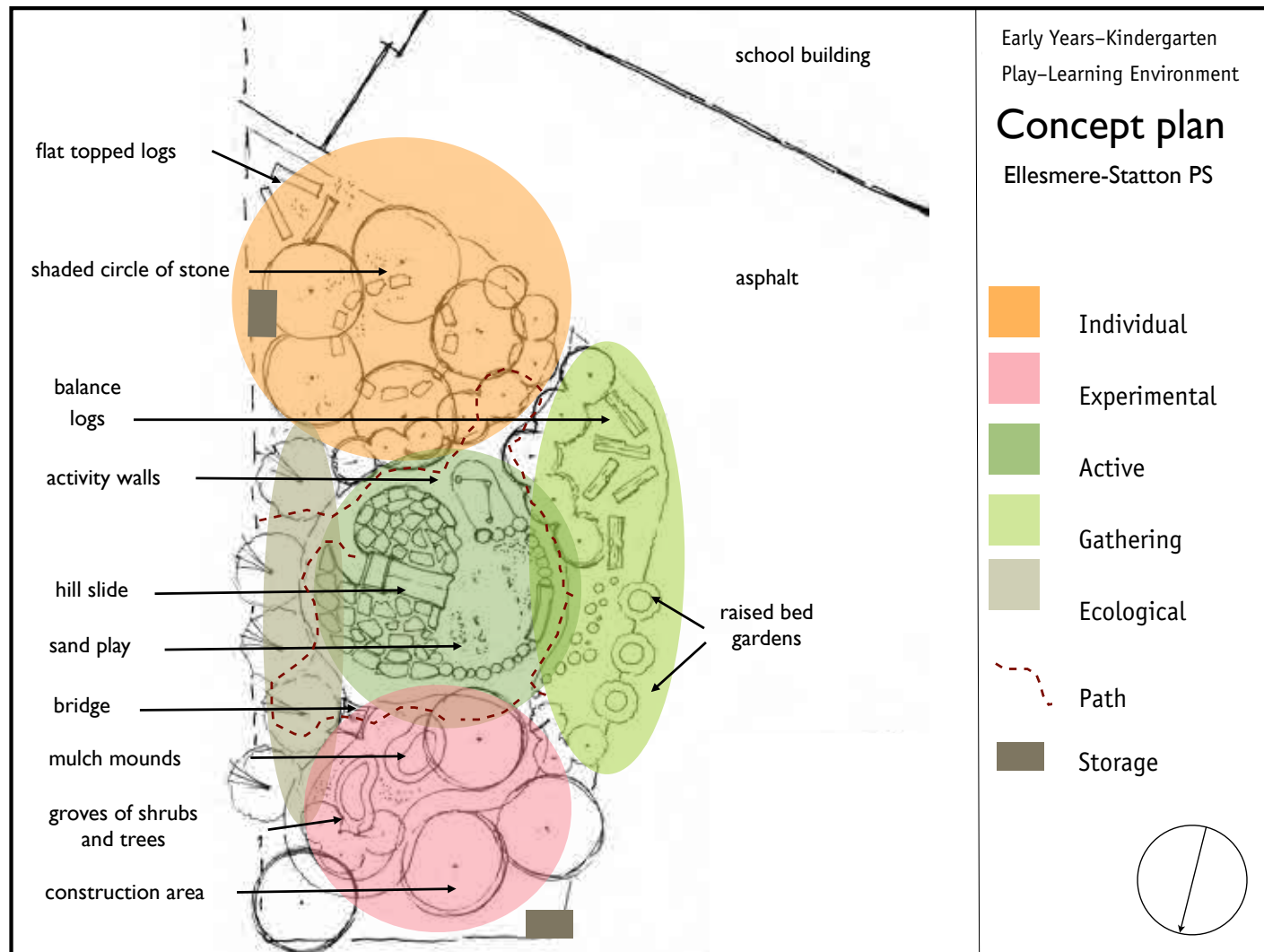


# Concepts *Realized*

The following two conceptual designs and accompanying images exemplify the use of the design framework and key spaces. These offer a snapshot of what an early years–kindergarten play-learning environment might look like.

## Concept 1

# Ellesmere-Statton Public School Concept Plan

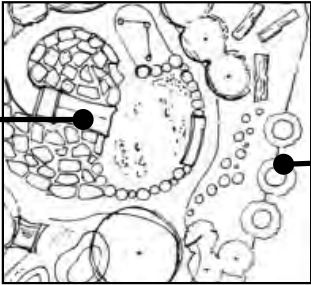


**Concept 1**

**Ellesmere-Statton  
Public School  
Concept Plan**



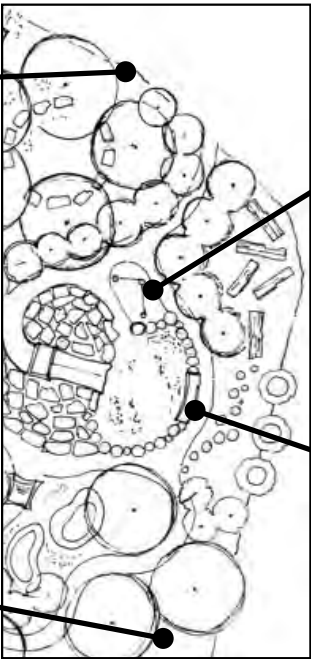
Hill Slide



Tractor Tires



Log Seating



Water Wall



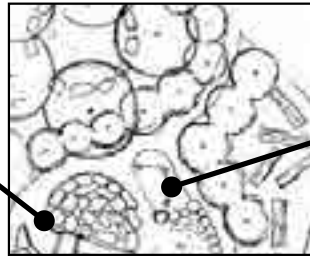
Construction Area



Flat Topped Log



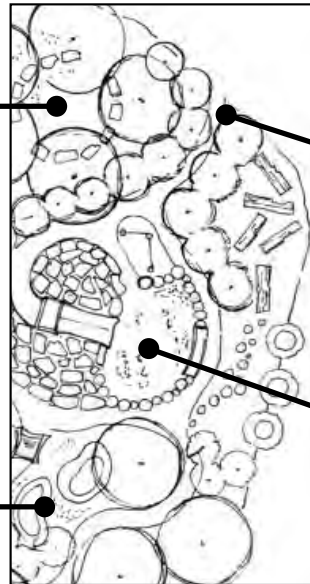
Textured Paths



Activity Walls



Shade Stone Circle



Meandering Paths



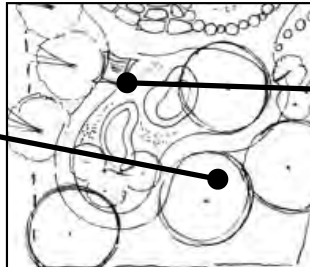
Berm and Hills



Sand Play



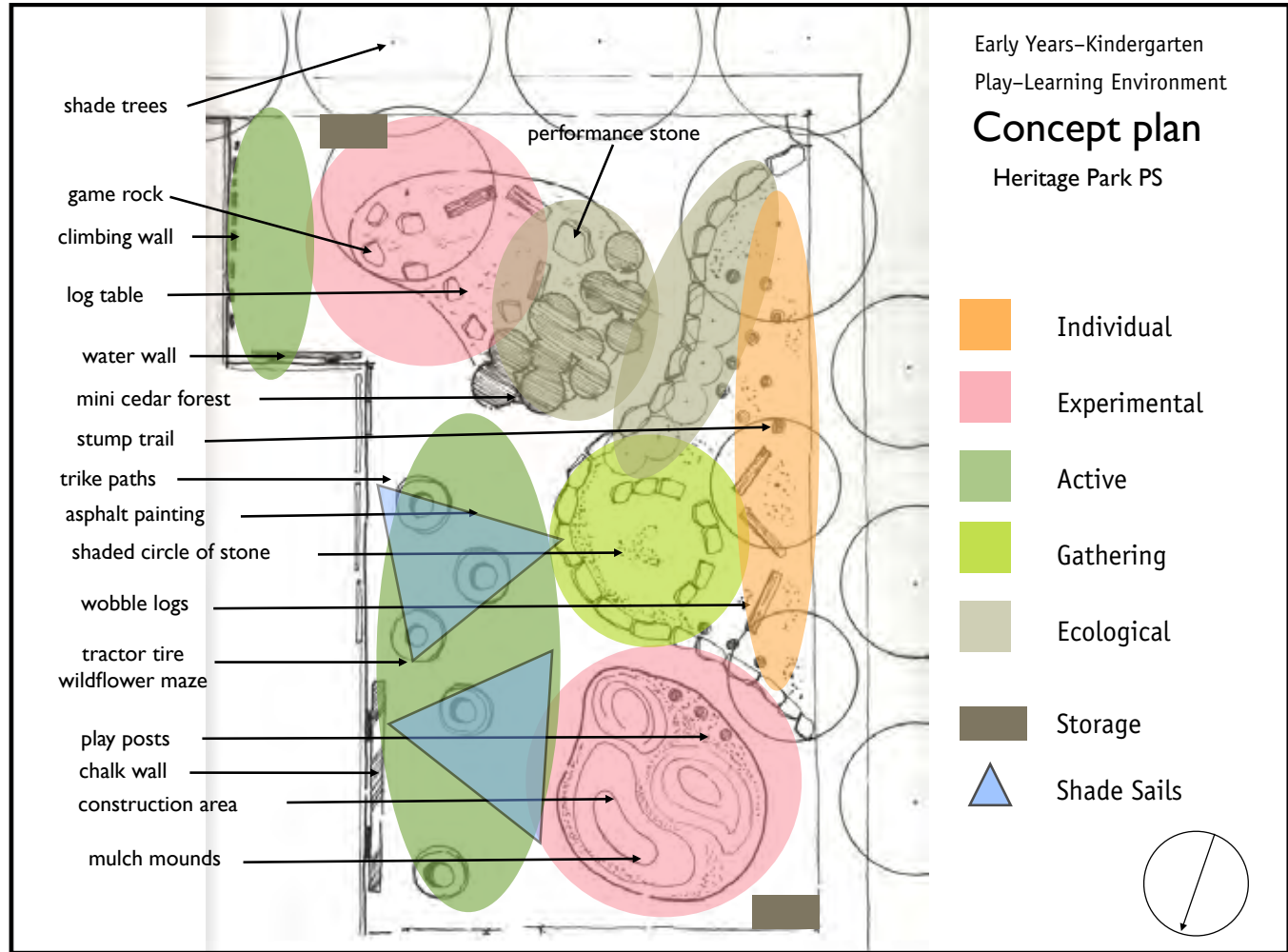
Groves



Screenings

## Concept 2

### Heritage Park PS Concept Plan





# Chapter 4

## Building Play-Learning Environments



“ There is an environmental conscience in the implementation practices and best practices. Designers, skilled trades, principals, teachers, parents—we must all do our part to implement these guidelines. ”

– Bruce Day, Grounds Standards and Design Co-ordinator, TDSB

# Building *Play-Learning* Environments

**B**uilding a successful early years-kindergarten landscape means utilizing guidelines and construction details based on “best practices” that have been purposefully developed for greening school grounds.

This approach takes into consideration:

- existing ecological features
- a variety of planting techniques
- efficient and purposeful maintenance protocols
- the use of sustainable construction practices

The sections that follow provide principles, guidelines, and some planning and construction details to assist design facilitators and skilled-trades professionals in planning and installing exemplary early years–kindergarten landscapes.



pg 62	<b>Creating Shade</b>
pg 66	<b>Designing with Trees and Shrubs</b>
pg 68	<b>Tree Placement</b>
pg 70	<b>Tree and Shrub Selection</b>
pg 74	<b>Installation of Trees</b>
pg 76	<b>Making Good Decisions: A Summary</b>
pg 78	<b>Protect Existing Trees</b>
pg 82	<b>Site Maintenance and Management</b>
pg 86	<b>Hard Surface Areas</b>
pg 88	<b>Soft Surface Areas</b>
pg 90	<b>Sand Play</b>
pg 94	<b>Water Play</b>
pg 96	<b>Pathways</b>
pg 100	<b>Site Amenities</b>
pg 110	<b>Gates and Fences</b>
pg 112	<b>Signage</b>

The TDSB promotes environmental sustainability in the design of their school grounds with the expectation that design solutions will help improve air and water quality, reduce greenhouse gas emissions, and enhance the natural environment.

# The Big Picture

## 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 small pond. Plant species that complement each other or support their intended purpose. In a butterfly meadow, mix species such as purple coneflower, black-eyed Susan, and columbine to attract our winged friends. Companion planting can also be a natural method of discouraging pests. Let the soil structure dictate what species go where. And don't forget to consider how people use the site. Restoring nature's place means we create a place for ourselves in it, not to harm nature but to learn, grow, and be inspired. One of the most important goals of ecological design is the creation of natural corridors between habitat fragments. (Habitat fragmentation refers to the division of a continuous habitat into separate, often isolated, small patches that are interspersed with other habitats. Small fragments of habitats can support only small populations of fauna, and these are more vulnerable to extinction.)

These corridors can be rest stops for migrating birds, and food and shelter for pollinators such as butterflies. Although the possibilities for creating corridors of green are limited by the size and surroundings of the school grounds, one effective natural corridor could be a hedgerow or a planting along a fence line (Holmes and Collyer).

## Use Sturdy and Sustainable Materials

Playgrounds take enormous abuse and require daily maintenance if they are to last. Design exemplary early years–kindergarten playgrounds using sturdy and resilient materials to withstand constant use and seasonal change. Plan for flexibility in future site use. Avoid sending useful materials to landfill. These actions have multiple benefits—reducing the energy required to extract, process, and transport resources, as well as reducing the impact and avoidable cost of waste disposal. Any time we reduce energy use by reusing materials on site, we produce fewer greenhouse gases. Use sustainably sourced construction materials when possible.

## Treat Water as a Resource, Not as Waste

Start with the big picture: 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. The increasing storm frequency and intensity of rainfall make this approach paramount.

Where practical, replace impervious hard-surface asphalt in play areas. Consider various options; depending on the site, turf or a suitable soft-surface play area may be a good alternative. Permeable concrete pavers, limestone screenings, and porous turf-stone pavers allow rainwater to be filtered down into the ground water. Runoff from asphalt can be directed to transition zones of trees and mulch situated between hard and soft surfaces.

## Protect and Expand the Urban Forest

Take every measure to protect existing natural areas and especially healthy and mature trees and native shrubs. Damage to trees and shrubs can occur during site servicing and utilities trenching, and the creation of access lanes and drainage systems from hard-surface play areas.

Provide growing conditions that will support long-term plant survival and growth. When planning for new trees and native shrub placement, be mindful of fire routes, snow clearing, and storage locations. It is also important to know about service access routes, portable move-in and move-out routes, student safety and security, building envelope maintenance, and construction



# Creating Shade

The Canadian Dermatology Association estimates that one in seven children born today in Canada will develop skin cancer later in life because of over-exposure to ultraviolet radiation (UVR). It is important to make planning and designing for shade a priority. One of the most effective ways to protect students and staff from UVR is to plant 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 early years–kindergarten 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.

Include as many trees as possible when designing school grounds. Strive to exceed the Toronto Green Standard goal of 30 percent canopy coverage of the entire property at maturity. Coverage of much more than this is easily achievable on virtually all school grounds, and results in so many positive outcomes.

Provide a variety of shade features in a number of areas on the school ground if possible—especially around asphalt and sand surfaces, which reflect much more UVR than grass does.

Decrease the demand for fossil fuels by shading buildings to reduce air conditioning use (being mindful not to interfere with solar panels).

Plant trees to increase positive effects on children’s health and behaviour and foster children’s awareness of their connection to the natural world (Louv, *Childhood’s Future*).

## Create Groves of Trees

Introduce shade using trees rather than shade structures or gazebos. Trees are a long-term investment: they improve and enlarge as they age (rather than deteriorate), are less expensive at the outset, and provide many environmental benefits. Plan for groves consisting of diverse species of native canopy trees to create natural gazebos for shade and cooling. Ensure that trees are located in these areas:

- close to the school building (rather than lining the far edges of the schoolground)
- in areas between and around active play spaces





## Placement of Deciduous Trees

Use deciduous trees on the southeast, south, and southwest sides to shade the building and to reduce reflectivity of paved surfaces and building walls. Plant large shade trees at the equivalent of 6–8 m intervals.

Where solar panels are present or planned on a roof, consider planting smaller trees (e.g., locust and hackberry) 7 m from the school, or planting large trees 10 m from the school, to avoid shading the panels.

Place trees where children spend most of their time: active play areas (asphalt areas, high-traffic or compacted-soil areas, near play structures, meet-and-greet areas (drop-off and pick-up locations), small and large seating areas (benches, outdoor classrooms, and theatres). If a choice is necessary, priority should be given to shading paved play areas to reduce UVR and increase cooling. (See Fig. 1.11, 1.12, 1.13 Deciduous Tree Plantings in permeable surfacing; Fig. 1.23, Timber Planter - Kindergarten)



## Placement of Coniferous Trees

Use coniferous trees to provide effective shade, wind protection (i.e., windbreaks), and winter interest.

Coniferous trees can block views and sight-lines; avoid planting them in front of windows or near entrance gates.

Many conifers are sensitive to salt, so plant them in areas where they won't be affected by potential winter maintenance practices.



## Built Shade

With the growing concern about the harmful effects of the sun's rays, the need to provide shade on school grounds is at the forefront of designing safe play environments. Be aware that built shade is more costly than natural shade (trees, shrubs, vines) and can attract vandalism. Design 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 built as protection from sun, wind, and rain include pergolas, trellises, and arbours—often used as an entrance to a garden or school building or as shelter on the school grounds. Consider the following points in your planning.

- Be aware that locating these structures next to buildings could allow access to the roof, possibly inviting undesirable and unsafe activity, including vandalism.

- Consider adding elements to existing structures to provide shade, such as an awning or pergola off a school or portable wall.
- Vines planted on the structure provide seasonal shade cover.
- Gazebos and pavilions can be built in a variety of shapes and sizes, accommodating different class sizes and numbers of children.
- Take care to ensure that the roof pitch and height from the ground provide the maximum amount of shade.
- Take into account snow loads in winter and water runoff from the roof.



# *Designing with* Trees and Shrubs

**A tree-planting strategy and design should be an integral part of every school's vision for their early years–kindergarten play space.**



## **Guiding Principles**

Consider shade and cooling and rooftop solar panels when choosing locations for trees.

Protect and increase biodiversity.

Provide optimum growing conditions to support long-term plant survival and growth.

Ensure that there is a reliable source of water for tree care (design buildings with external roof leaders and cisterns or rain barrels; direct surface runoff toward planting areas; repair existing hose bibs; install new hose bibs).

Reduce the demand for potable water through greater efficiencies (grading and creating infiltration trenches).

Choose good nursery stock—planting healthy and structurally stable trees is a primary goal. Protect planned and existing trees as part of the design.

## 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 wind
- absorb water and replenish the natural 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



# Tree Placement

*The right location of trees is essential to their survival and long-term health. Following these guiding principles will help you to realize a successful project.*

## Guiding Principles



When planning tree placement, be aware of fire routes, snow clearing and storage locations, service-access routes, possible future expansions of the building or parking lot, addition of more portables, portable move-in and move-out routes, student safety and security (sightlines), building envelope maintenance and construction access, and tree care (access to a water source). Armed with this crucial information, you can plan for trees that will last!



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: avoid possible erosion, compaction, and exposed roots.

## Maintaining Visibility

- Avoid blocking night lighting or interfering with security cameras.
- Remove low, side branches of large shrubs in areas where visibility is a concern. Maintain the multi-stem form of the shrub.
- Adjust patterns of supervision and routine observations of school grounds to reflect the new plantings.

## Tree-Planting Distances From Built Objects

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

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

## Avoid Salt Damage

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

- Be mindful that trees planted in paved play areas may be at risk of winter salt damage. Check to see if paved play surfaces are plowed in winter and if salt is used to keep them clear. Encourage schools to stop plowing and salting paved areas (other than the building's access routes) as a general practice whenever possible.
- Calculate drainage flow and avoid planting trees in any other areas subject to salt runoff (e.g., locate planting islands on the uphill side of salted areas, or plant trees in large raised planters). (See Fig. 1.23, Timber Planter - Kindergarten)
- Plant in a large box planter using small varieties such as Serviceberry or Dogwood shrubs, which require more watering.

(For more information on salt-tolerant trees and shrubs, refer to Evergreen's Native Plant Database at <http://nativeplants.evergreen.ca>)



*NOTE: Do not plant trees within access routes or snow storage areas and avoid planting trees in areas of potential building expansion, portable installation or parking lot expansion.*

# 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 selections of tree/shrub species.

- sun/shade requirements
- size of the planting space and proximity to overhead wires and rooftop solar panels
- 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)
- consider 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



- avoid species that are low-pollinating and 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](http://www.omafra.gov.on.ca/english/crops/facts/noxious_weeds.htm) design for diversity and avoidance of monoculture plantings

- design for diversity and avoidance of monoculture plantings

Refer to Appendix F: Recommended Plant Lists; Appendix B: Criteria for Acceptable Nursery Stock; and the Native Plant Database at [evergreen.ca](http://evergreen.ca) for associated plant lists



## Tree Sizes

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

## Tree Size for Deciduous Trees

Trees should be a minimum of 45 mm in remote parts of the school ground where vandalism is not a concern, and 75 mm caliper in high activity and/or vandalism-prone areas.

Prune trees to 2 m from the ground to the lowest branches to prevent children from swinging and tearing the branches away from the trunk and to allow good visibility when the tree is mature.

Smaller trees, whips, and seedlings may be considered for Nature Study Areas where mowing is carefully managed and students can do the planting.

## Tree Size for Coniferous Trees

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



## Native Species

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

- 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 provides 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 native species or non-invasive species in areas around buildings or access routes.

### *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://native-plants.evergreen.ca/> for a comprehensive list of native species.



# Installation 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

See Figures 1.01–1.13, for tree planting details.



- For a single tree planted in primarily hard scaped areas, provide a minimum of 30 cubic metres of quality soil.
- For trees planted in groups of two or more in primarily hardscaped areas, provide a minimum of 15 cubic metres of high-quality soil per tree.
- For the best chance of survival, provide a minimum 3-square-metre opening for a single tree in hard surfacing.
- Dig the hole for the tree at least three times the width of the root ball and angle the sides to 45 degrees.
- 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 Fig. 1.02.)

*NOTE: Avoid using wires and hoses around the tree trunks.*



# Making Good Decisions

## A Summary

# DO

Supply the school with a Watering Schedule Sign-up Sheet: <http://www.tdsb.on.ca/www-documents/programs/ecoschools/docs/11-Watering%20Schedule%20Sign-up%20Sheet.pdf>.

- Design for diversity.
- Use native species wherever possible.
- Plant trees in hard surfaces to shade areas of active play.
- Plant honey locust and hackberry (small-leaved trees) in courtyards.
- Use tall shrubs, such as Alternate Leaf Dogwood, Serviceberry, or Nannyberry for shading small spaces.
- Plant a variety of native tree and shrub species for teaching and learning purposes.
- Use annual vines on fences.
- Plan for planting that is manageable and sustainable.
- Specify deciduous trees at 75 mm caliper and coniferous trees 2.5 m height in areas of active play.
- Determine drainage flow and avoid planting trees in areas subject to salt runoff (e.g., locate planting islands on the uphill side of salted areas or plant trees in large raised planters).
- Plant trees away from neighbouring houses and gardens on property lines.
- Insist the school community have a summer watering plan in place as a condition of planting trees.



# DON'T

- ✘ *Plant single species of trees (monocultures).*
- ✘ *Plant species with toxic parts (Refer to CAN/CSA-Z614-07 Table G.1. for plants to be avoided in children's play spaces.)*
- ✘ *Plant invasive non-native species, such as Norway maple, or species vulnerable to insects and disease, such as Ash.*
- ✘ *Plant trees with large fruit or large cones—these can attract wasps and provide possible projectiles in the school ground.*
- ✘ *Plant trees with soft bark, such as Ginkgo*
- ✘ *Plant trees with attractive bark that peels, such as birch.*
- ✘ *Plant trees on the top of berms because of possible erosion, compaction, and exposed roots.*
- ✘ *Plant trees in the middle of parking lots.*
- ✘ *Plant trees in areas of potential building expansion, portable installation, or parking lot expansion.*
- ✘ *Plant nut trees near school buildings (to guard against possible allergies and anaphylaxis).*

# Protect Existing Trees



Consider the following tree-protection goals in the early stages of planning and design to ensure new and existing trees are properly protected and cared for in the short and long term:

- Protect trees rather than repair injury.
- Limit tree root injury to a tolerable level.
- Eliminate the use of chemical fertilizers, pesticides or insecticides and anti-desiccants.

## Protecting Existing Trees Throughout Design and Construction

Throughout the planning, design, and construction phases of the project, take every measure to protect existing natural areas and significant healthy trees. Damage can

occur during site servicing and utilities trenching, parking lot expansion, and the creation of access lanes, drainage systems, and hard-surface play areas.

Protect all existing trees within or adjacent to the construction area before construction starts by creating a Tree Protection Zone (TPZ) with a Tree Protection Barrier (TPB) erected around its perimeter. The minimum tree protection zone will be the drip line\* of the tree.

The exception to the rule would be for columnar or pyramidal trees, in which case the tree protection zone will be determined on site. This is why it is so important that the designer shows accurate canopy dimensions on the drawings for all existing trees, as well as adjacent neighbouring trees whose

## What is a Drip Line?

**Drip line is a “line” on the ground corresponding to the outermost reaches of the branch tips and generally corresponds to approximately half of the root zone of most trees. Pyramidal and columnar form trees have root zones larger than their drip-line and the TPZ and TPB should be adjusted outward accordingly.**

canopies (and underground root systems) will also affect construction plans.

Within the tree protection zone, there can be:

- no root cutting
- no alteration or disturbance to existing grades of any kind
- no changes to the grade by adding fill, excavating or scraping
- no grading, trenching, excavating, or soil compaction
- no storage of construction materials or equipment
- no stockpiling of soil, debris, or construction waste
- no movement or storage of heavy vehicles or equipment

## Evaluation of Existing Trees

Each existing tree is to be evaluated by the landscape architect according to species, age, health, vigour, size, form, structure, drainage patterns, location, and surrounding features. The landscape architect is required to provide accurate canopy dimensions and grades of trees on base plans.



## Protecting Roots



To ensure that new and existing trees are properly protected and cared for in the short and long term, follow these tree-protection best practices in the early stages of planning and design:

- Be mindful that ninety percent of a tree's roots are within the top 30 cm of the surface. Specify directional boring for installation of all site servicing (utilities) within the TPZ of existing trees. Do not allow excavation or trenching within the TPZ of existing trees. Tree roots should not be cut off to accommodate curbs, playgrounds, hard surface walkways, or other landscape features. Cutting roots affects the safety, stability, and health of the tree.
- Limit root damage when working in a TPZ by using specialized construction techniques such as low pressure hydro-vacuuming, air knifing, directional boring or tunneling, and arboricultural techniques such as root pruning, hand digging, shoot pruning, mulching, irrigating, and fertilizing.
- Protect tree roots using 1.2 m (4') x 2.4 m (8') high-density polyethylene mats such as Durabase composite mats or AlturnaMats.
- If it is necessary for heavy equipment to travel over root zones during construction, a minimum 23 cm (9") layer of tub-ground mulch is to be spread over roots (to be maintained over the duration of the job) and recycled or reused on site upon completion of the work. Tree protection barriers must be erected before the construction project starts, maintained throughout the project, and removed when final inspection and sign-offs are complete. They are to be included and priced as part of the project.



- Short-term projects (2 months or less): use plastic safety fence and standard T-bars.
- Longer-term projects: use 10-gauge chain-link fence and standard T-bars spaced approximately 2 m apart (see Fig. 1.02, Protective Tree Cage).

## Grading

Do not change the grade (finished elevation) within the TPZ of existing trees.

## Transplanting Trees

Transplant trees up to 15 cm-caliper rather than cutting them down if this is an option (depends on the species and time of transplanting).

## Removal

Where removal of existing trees is unavoidable, have the trees appraised by a certified arborist and obtain the necessary tree removal permits from your city or municipality. Replace the removed trees with trees of equal value. The assessed value of the replacement trees must equal the assessed value of the trees removed.



# Play-Learning Environment Maintenance

*It is necessary to consider the maintenance of the proposed play space features throughout the planning and design process. A well-planned and organized maintenance strategy will protect your investment of energy, resources, money, and time.*



## 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 of water every two weeks. Landscape architects should specify these parameters alongside their tree planting detail. For a school-based watering strategy see Appendix A: Watering Guidelines for Newly Planted Trees.

### *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.

## Protecting Newly Planted Trees

Where there is concern for the life of the tree because of possible vandalism or unintentional damage to the bark, the tree trunk could be protected in the following ways:

### Planting beds

Planting trees into planting beds will protect roots and bark from traffic and lawn maintenance equipment.

### Wire caging

See Fig. 1.02, Protecting Tree Cage.

### Rodent Guards

For smaller trees (below 60 mm) rodent guards should be used when planting in areas where mowing has been halted.



## 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, p. 64). 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, Zherbicides, pesticides, or peat moss.



Obtain mulch supplies from virgin bark and wood sources.

Tub-ground 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.

Chipper mulch can be used on trees that are far from the school building and catch basins (large wood chips plug up catch basins).



### Amount of Mulch per Tree

New tree: apply approximately 3 wheelbarrow-loads per tree to a depth of 15 m.

Existing tree: spread mulch in a doughnut shape around the trunk out to the drip line.

Top up the mulch in active play areas annually; less active areas can be topped up biannually.

To add nutrients, top mulch with 2.5 cm compost or worm castings, then replace mulch to a depth of 15 cm each year.

In the fall, keep leaves under the tree to break down into humus and naturally fertilize the tree.

### Depths of Mulch

High-traffic areas: 15 cm

Planting beds: 10 cm

Over existing tree roots: 15 cm

Base of newly planted trees: 15 cm and up to 2 m diameter

Pathways: 15 cm

## Shrubs and Vines

Shrubs and vines require more maintenance and should be incorporated into beds to make them easier to care for and to improve their chances of survival. When choosing species and locations for a school ground project, consider the following factors:

- 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. Carefully prune the side branches at the base to allow visibility under and through the shrub. Avoid shrubs whose tops need to be pruned and clipped regularly, as this adds a maintenance burden.
- Perennial vines on fences need ongoing maintenance: weedtrees and shrubs that quickly become established along the fence line and need to be removed. Choose annual vines instead that you can remove at the end of each growing season.

- Consider using vines for shade and habitat on pergolas and fences. Non-natives are needed for this function as the vines need to be self-clinging. Be sure to check preferred species of vines for toxicity as any plant parts can be poisonous. (Refer to the Canadian Standards Association document CAN/CSA-Z614-07 Table G.1 Plants to be Avoided in Children's Play Spaces, for a list of toxic plants).

### Minimum Installation Height Requirements

Deciduous tall shrub, planted as singles or in groves: 200 – 250 cm

Deciduous small shrub, planted in a protected area: 60 cm

Coniferous shrub, planted in a protected area: 60 cm



# Hard Surface Areas

*Remember to strike a balance between hard and soft surfaces in the design. Children need a variety of textures and surfaces that provide an array of play options. Because children are much closer to the ground than adults, a varied palette of surface materials in the play space can be a strong stimulant to a child's creativity and curiosity. Different kinds of natural surfacing have proven to be practical and durable in natural play spaces. It is also important that these play spaces strike a balance between the two to ensure their long-term maintainability.*



Hard surface areas include walkways, meet-and-greet areas, open space for games and sports, and maintenance access. Provide shade cover to at least 30 percent of all hard surface areas.

## Asphalt

When using asphalt as a surface in play-learning environments consider the following:

- Strike a balance between areas of hard and soft surfacing.
- Grind or crush the asphalt and reuse it on site.
- When planting trees, constructing planting beds, or establishing areas of turf in asphalt, remember to remove all rubble and the granular base along with the asphalt to help plant roots penetrate and become established in existing soils.

## Concrete

When using concrete for walkways, consider using a colour or stain to reduce the sun's glare and reflection. This will help to reduce UVA and UVB exposure.

## Permeable Paving

Consider using permeable paving on walkways and in parking lots to reduce water runoff and increase ground percolation. The 10cm-thick Unilock-Turfstone works well around trees that have been planted in asphalt areas. Unilock-Ecostone could be considered as well.

## Other Materials

Limestone screenings, crushed brick, and interlocking brick could be used in a variety of ways within the school ground.

Reuse materials for surfacing (e.g., tiling, mosaics of materials embedded in concrete, cob, or rammed earth).

### ***A NOTE TO DESIGN PROFESSIONALS***

**When designing large areas of hard surfacing, plan to retain a minimum of 5 mm of rainfall on the site through rainwater reuse, on-site infiltration, and evapotranspiration.**



# Soft Surface Areas

*Both soft and hard surfaces are needed for different types of play activity. Often schools have enormous asphalt yards that can, in part, be transformed into useable green space.*



## Hills and Berms

For a successful outcome, keep the following observations in mind:

- Hills should not be too high and should have a gradual slope.
- High hills are difficult to maintain, run a high risk of wear, and pose mowing problems. Typically, turf cover on berms lasts only 1–2 years and has the potential to turn into mud hills.
- Consider effects that a berm could have on drainage.
- Berms must not contain any rubble.
- If steeper hills are required, design to avoid erosion. This may include terracing (timber or stone).
- Trees are best planted at the base of the slope where the mulch will stay in place and water has a better chance of infiltrating the soil around tree roots, which will not be exposed through erosion or settling of the berm.

## Tub-Ground Mulch

Berms made out of mulch are durable and provide great play value in the early years—kindergarten play space. (See Fig. 3.04 Mulch Mound.) They must be replenished annually or biannually, but otherwise require little maintenance.

- Tub-ground mulch is recommended for surfacing in play spaces as it tends to mat together and stay in place.
- Avoid wood chips as a surfacing for play areas—they are a safety concern when thrown by lawnmowers and tend to float during heavy rainfalls, plugging up catch basins and causing flooded areas.
- Mulches should be used in high-traffic areas (including pathways) at 15 cm depth. Replenish mulch every year.
- 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.

- Tub-ground mulch (as well as pine needles, or sand) is a good surface for outdoor classrooms.

## Grass

Grass provides a more cushioned surface for play and a cooler surface than artificial turf, asphalt, and rubberized surfaces. Soil erosion can be reduced with deep-rooted grasses and can increase infiltration as water passes over the surface, allowing for recharging of underground water.

- Turf should have at least 300 mm (12") of growing medium.
- This medium must not be clay; turf needs sandy loam soils that have a high percentage of sand.
- Perennial ryegrass and rhizomatous tall fescue are resilient grasses and are good choices for school grounds.
- Wall taps connected to a hose and oscillating sprinkler can water the turf and provide water-play opportunities.



# *Sand* Play



**M**any adults prefer to do without sand altogether because they feel it's too messy. But if you watch a group of children in a sand pile, you'll see its play value. Besides soothing emotions and providing rich, 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.

## Containment

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

## Installation Details

Depending on site conditions, a base of clear gravel topped with geotextile and/or weeping tile will be necessary. The sand needs to be 60 cm deep to provide a challenging depth for digging. If sand play is not possible consider a soil pile; children love to dig in soil as well. Make the sand play area accessible with suitable surfacing and appropriate transfer systems—decks, ramps, steps, etc.

For more information see [http://www.allabilitieswelcome.ca/Playspaces/files/Annex\\_H\\_Guidebook.pdf](http://www.allabilitieswelcome.ca/Playspaces/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. The storage could be a shed or it could be designed into the perimeter seating. In designing the storage space, make it accessible to the children so that they can retrieve and put away the materials themselves.

## Shade

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

Use granitic sand rather than brick sand or concrete sand, which tends to blow around on dry windy days and can be a safety concern.

## Maintenance

Annual topping up and occasional replacement will be required. Do not rototill.



# Water Play



Water features provide many benefits on school grounds, including creation of habitat and food sources for local wildlife, a unique resource for a variety of curriculum-based activities, and improved retention and infiltration of runoff from precipitation.



Some considerations to keep in mind:

- Try solar water pumps or water falls to provide constant movement in the water—standing water should be avoided.
- Courtyards provide great opportunities for designing water features with restricted access.
- Bog, downspout, or wetland gardens may be viable solutions to wet-area problems on certain school grounds, and they also increase the propagation of wetland plant species and the creation of wildlife habitats.
- Be sure that water levels are below 46 cm—otherwise there must be a grate over the top of the water surface or a fence with a locked gate around the water feature.



# 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 recreational and 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 children to move between and through elements, helping them to orient themselves in space.

We recommend following these criteria for designing pathways in early years–kindergarten playgrounds:

- 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 and pull-off points along the path to rest, read signs, or play.
- Create designated paths for tricycle riding and cart pulling.
- Design pathways in the form of intersecting circles to allow for continuous movement—avoid dead-end paths.
- All pathways should be built with accessibility for all students in mind.



# Guidelines for Pathway Surface Materials



Materials should be non-slip asphalt, concrete, unit pavers, turf-stone, limestone screenings, or crushed brick.

Tub-ground 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 (See <http://www.astm.org/Standards/D6322.htm> to download a copy of the standards).

Do not use pressure-treated lumber on any surface on a school ground. (See Appendix D: Evergreen's Rationale for Avoiding ACQ Lumber)

Cedar is an excellent choice of wood, as it is not treated and has a natural resistance to rot.

## 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 meaningful, practical and sustainable.

## Bridges

Connecting spaces with bridges or tunnels provides variation and challenge for children and enhances the visual interest of the play space. For example, the corduroy bridge provides slight variations in height at the ground level, encouraging children to respond to the uneven terrain, which helps them to develop gross motor skills (See Fig. 5.01, Wooden Bridge).

## Garden Paths

Use traprock, marco clay, limestone screenings, wood mulch, straw, or mown grass for perimeter garden paths, as well as between container and vegetable gardens.

Make formal paths 1.5 m wide, to be wheelchair accessible and for two people to pass each other.

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 10–15 cm of tub-ground mulch.

If wheelchair accessibility is desired, use limestone screenings or ASTM approved wood fibre. (See Fig. 3.02, Limestone Screening Walkway.)



## Standard Dimensions for Accessible Paths

- **Minimum width of 110 cm for single use, to 220 cm for two wheelchairs to pass.**
- **Maximum slope of 5%, although 1–2% is ideal.**
- **Surfacing must be non-slip materials (e.g., asphalt, limestone screenings).**
- **A 185-cm wide “passing space” must be provided every 30 m.**
- **Headroom of at least 200 cm must be provided along the entire length and width of the path.**



# Site Amenities

*Everything from logs for seating to art walls, from food gardens to nature study areas, the following site furnishings, themed gardens, and interactive elements will create a strong sense of place and opportunities for children to engage in stimulating, hands-on learning experiences.*

## Seating



Playtime is full of activity and movement as children rush and flow from place to place. 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 lovely cement mosaic in the shape of a turtle!

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

Choose natural materials instead of synthetic materials wherever possible.

Consider safety and how to minimize vandalism as you design.

Avoid constructing with wood that has been treated with chemicals.

Keep maintenance and sustainability in mind.

Observe students at play to determine where students currently gather and what activities take place in those areas.

Interview staff to understand what their needs are with respect to teaching outdoors.

Make sure the seating is accessible to all children.

Allow for seating in a variety of sizes, shapes, and arrangements, based on project goals and the different ages of the children.

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). 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.

Locate class seating away from noisy streets and close to the school building for ease of transporting teaching and creative tools and equipment. Orient to the east so students are not looking into the sun.

Consider ways that a gathering space can be used for outdoor learning.

To whatever extent possible, make seating areas beautiful through collaborative art projects and creative installations that tell stories of the uniqueness of place.

Wherever possible, use a diversity of natural materials and integrate artful expression into the design.



# Types of Seating

Seating that is either permanent or moveable is essential in the children’s play 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.

## Ready-made Wood Benches

In some locations, benches may be preferred to seating stones. The “Boston Bench” by Henderson Recreation has proven to be durable in school grounds and easy to repair when needed. Square wood and metal frame benches placed around trees and “floating” on grade help to protect new and existing trees and provide a shady spot for socializing, play, and learning. (See Fig. 1.32 Square Wood Bench—with Deciduous Tree.)



## 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. Angular limestone armour stone and “Ledgerock” are generally the best seating stones as they are layered angular, block shaped, and often contain fossils and crystals. The following are guidelines for placement:

- Place with tops level so they are comfortable as seats and can be used as tables.
- Be sure to remove any sharp edges—bush hammer, chisel, or grind down the edges of the stone to a 6 mm radius (See Fig. 2.02, Armour Stone Seating, Single Boulders.)

- Place either tight together or minimum 1.8 m apart to discourage jumping from rock to rock.
- Optimum “seat-to-feet” height range, related to the top of the mulch for Junior Kindergarten/Senior Kindergarten: 275–325cm (See Fig. 2.02, Armour Stone Seating, Single Boulders.)
- Provide a surface such as mulch around the base of all seating stones for a minimum 1 m distance.





## 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 schooground.

Logs should be solid hardwood and peeled.

Optimum "seat-to-feet" height range, related to the top of the mulch. (See Fig. 2.02, Armour Stone Stone Seating, Single Boulders). 275–325cm (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 the log on a bed of gravel to eliminate contact with the soil which would accelerate rot.

Fasten or trench any large logs that could pose a risk to student safety.

Logs can be used in loose parts play; children will move and use log discs in a variety of imaginative ways.

Logs may need to be replaced after 10 years due to weathering.



## 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 children who might be involved in outdoor classes.
- Provide enough open space for instructors to display items and for children to make presentations or engage in passive creative play (for an example of amphitheatre style seating see Fig. 2.04 Armour Stone Seating—Tiered.)



## Other Seating Materials

- Wood (avoid constructing seating with pressure treated wood - See Appendix D, Evergreen's Rationale for Avoiding ACQ Lumber)
- Mosaics
- Cob
- Straw bales
- Rammed Earth



## Tires



Use tires for play; singly or in combination, tires can be used to jump through and over.

Use tires as containers to grow flowers—but not vegetables, since potentially toxic chemicals may leach into the soil over time.

Use tires as a protective barrier around a pot or barrel in which edible plant material is growing.

Be aware that tires used as raised planting beds dry out quickly and will need more water than planting beds at grade.

### Some Cautionary Notes

Tires can become hot when placed in a sunny location—be sure to place tires in a shady play space.

Ensure that the tires will not trap water and allow standing water, dirt, and debris to accumulate.

Avoid tires with punctures or exposed steel. Check them regularly for possible protrusions and sharp edges.

Ensure that tires do not have any chemical residue that could rub off on children's hands or clothing.



## Activity Walls

Use standard marine grade plywood 1.2 m x 2.4 m x 1.27 cm.

Apply one coat of primer and two coats of flat black paint.

Mount 15 cm above grade.



## Artistic Elements

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

- Attach artwork to fences.
- Consider murals on pavement or walls.
- Painted tiles, hand-made stepping stones, figures, statues, and decorative benches can become focal points to make each school ground unique and different.
- Artwork related to the weather elements (sun, wind, rain) can draw attention to the microclimate within the school ground and can be tied to curriculum investigations of local weather systems.
- Murals, maps, mazes, and paw prints painted on pavement or walls.



## 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.



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.

If your Nature Study Area, is adjacent to neighbour's property be sure to maintain a mown strip approximately 2 m 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 value to students' inquiry-based learning.



## Habitat Gardens

Natural habitat communities on school grounds provide excellent educational models for exploring plant-animal interactions and life and energy cycles.

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:

- PRAIRIE BUTTERFLY GARDEN
- MEADOW–WET AND DRY
- WOODLAND BIRD GARDEN
- FOREST EDGE WOODLAND–HEDGEROW
- RIPARIAN POND GARDEN
- MARSH OR BOG
- STORM WATER RETENTION GARDEN
- ALVAR AND XERISCAPE GARDENS

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

- THEME GARDENS
- SPIRAL GARDENS
- MUSIC GARDENS
- PEACE GARDENS
- STORYBOOK GARDENS
- RAINBOW GARDENS
- PIZZA-SHAPED GARDENS
- SENSORY GARDENS



# Gates and Fences

*Gates and fences can be opportunities for creating a sense of place that speaks to children's imagination and creativity. They provide opportunities for artistic expression, a magical transition from one space to another, and a playful sense of entry. These also need to address the goals of the design and not impart barriers to entering or leaving the play space.*

## Guiding Principles



Include colours, varied textures, peepholes, 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.

Gates must be wide enough for wheelchair access.

Pedestrian gates need to be 150 cm wide.

Maintenance access gates need to be 300 cm 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.



## 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 Fig. 4.01, Wood Rail Fence)
- Temporary snow fence

Use galvanized brackets and screws. Do not use nails to secure fence or gate structures.



# 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.

Place signs at a comfortable height for people to read or touch: standard mounting height for students is 120 cm (or lower depending on their age) and 150 cm for adults.

Involve teachers and students in making signs.

NOTE: Engraved rocks provide vandal-proof long-term options.



# Figures

**W**hen considering the following figures, specific site conditions and school/community requirements must be taken into consideration. These figures are provided for information purposes only. Details within these figures may not be applicable in all circumstances. Copyright is retained jointly by the Toronto District School Board, Evergreen and Northwood Associates Landscape Architects Ltd. These figures are not to be reproduced without permission.

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REMOVE ALL TIES

PRUNE TO REMOVE ALL DEAD AND INJURED BRANCHES PRIOR TO PLANTING. DO NOT CLIP LEADER BRANCHES

1-BAR STAKES AND WIRE MESH PROTECTIVE CAGE. REFER TO DETAIL 1.02

APPROXIMATE EXISTING GRADE - PLANT TREES 50 TO 100 mm 'PROUD' OF ADJACENT GRADE

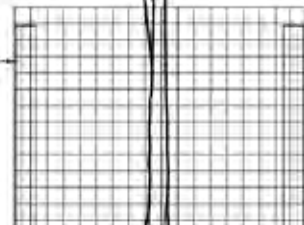
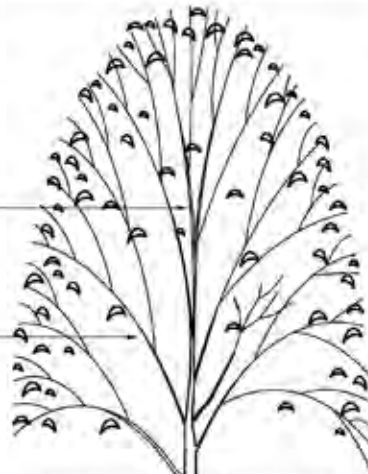
SOD AS REQUIRED

8 x 8 OR WB (WIRE BASKET) ROOT BALL

VARIES

SECTION

PLACE ROOTBALL ON UNDISTURBED SOIL



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 m<sup>3</sup>. 'AMENDED SOIL' TO BE ENVIRO-MIX (A BLEND OF MUSHROOM COMPOST, SAND, SAWDUST AND PEAT) AS SUPPLIED BY ZEPHYR PEAT LAND HARVESTING 905-473-5244 (OR APPROVED EQUAL).
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

SET TREE HIGHER THAN ADJACENT FINISHED GRADE TO ALLOW FOR SETTLEMENT

100 DEEP SAUCER. FILL WITH 150 mm DEEP APPROVED MULCH (TAPER TO 50 mm AT TRUNK). TUB GRINDER (PEELER BARK/UTILITY) MULCH WILL BE ACCEPTABLE. ALLOW 0.5 m<sup>3</sup> OF MULCH PER TREE

CLIP AND REMOVE TOP THIRD OF BURLAP AND WIRE FROM ROOT BALL AFTER APPROVAL OF SPECIMEN

PLANTING MIX AS SPECIFIED IN NOTES ABOVE. BACKFILL IN 150 LIFTS

SCARIFY SURFACE OF SUBSOIL BEFORE PLANTING. ENSURE SUBSOIL HAS SUFFICIENT DRAINAGE TO PROMOTE HEALTHY ROOT GROWTH

TAMP DOWN BACKFILL SOIL UNDER ROOT BALL TO ELIMINATE AIR POCKETS AND MINIMIZE SETTLEMENT

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SCHOOL GROUND STANDARD CONSTRUCTION DETAILS

DATE: JANUARY 2013

NOT TO SCALE

DRAWN BY: KIM ALLERTON DALA

CHECKED BY: BRUCE DAY

DETAIL #

DECIDUOUS TREE PLANTING SOFT SURFACE

1.01

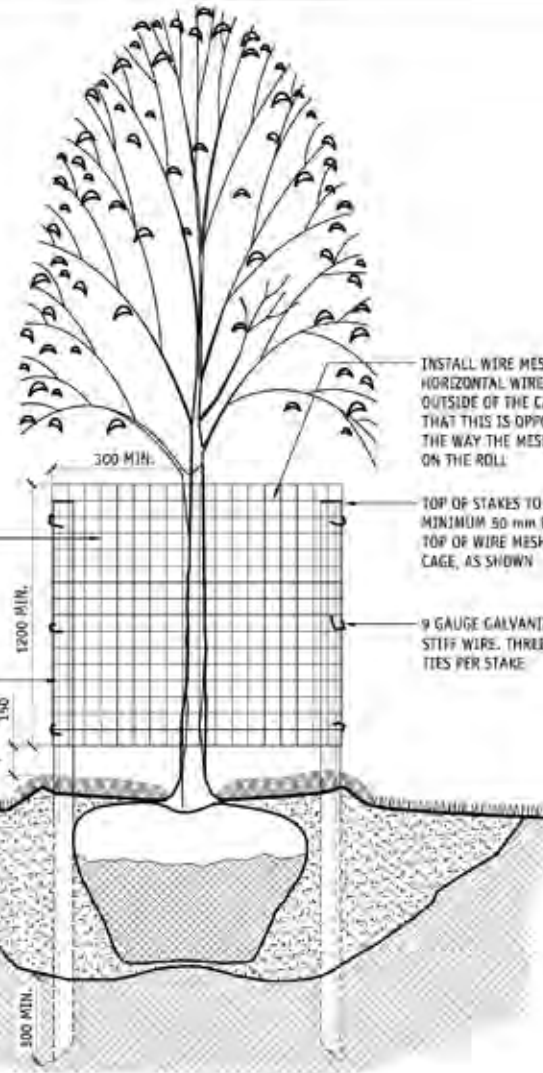
**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS, DO NOT SCALE DRAWING.
2. WIRE MESH PROTECTIVE TREE CAGE TO REMAIN IN PLACE FOR TEN (10) YEARS.
3. 2743 (9') OF WIRE MESH (54 SQUARES) IS REQUIRED FOR EACH TREE. ONE SINGLE ONE HUNDRED FOOT ROLL OF MESH YIELDS ELEVEN (11) CAGES.
4. ALL PROTECTIVE TREE CAGES TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

WIRE MESH PROTECTIVE TREE CAGE- 1200 HIGH 10 GAUGE 50 x 50 (2" x 2") GALVANIZED WELDED WIRE MESH FASTENED TO T-BAR STAKES TO FORM CIRCULAR CAGE AROUND TREE TRUNK

2400 (8') LONG 40 x 40 REGULAR (NOT LIGHT DUTY) T-BAR STAKE, THREE (3) PER TREE. DRIVE STAKE MINIMUM 300 mm INTO UNDISTURBED SOIL OUTSIDE ROOT BALL. ONE STAKE TO BE ON WINDWARD SIDE OF TREE

ENSURE 150 GAP BETWEEN BOTTOM OF WIRE MESH CAGE AND FINISHED GRADE OF SURFACE TREATMENT



**SECTION**

INSTALL WIRE MESH WITH HORIZONTAL WIRES ON THE OUTSIDE OF THE CAGE. NOTE THAT THIS IS OPPOSITE TO THE WAY THE MESH COMES ON THE ROLL

TOP OF STAKES TO BE MINIMUM 50 mm BELOW TOP OF WIRE MESH CAGE, AS SHOWN

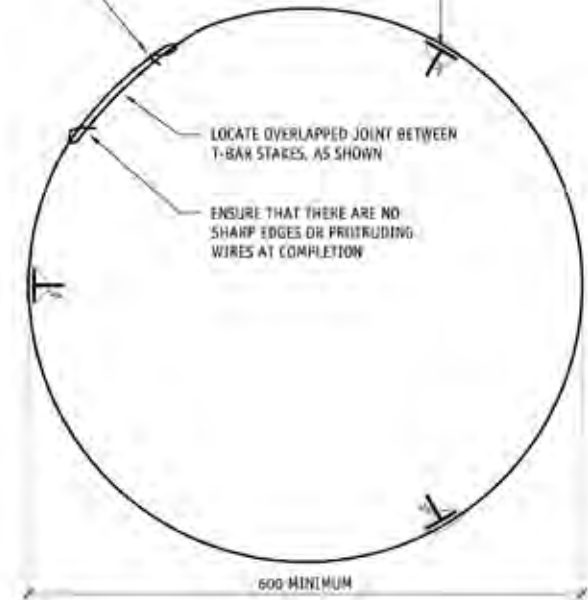
9 GAUGE GALVANIZED STIFF WIRE, THREE (3) TIES PER STAKE

OVERLAP WIRE MESH BY THREE (3) SQUARES AND FASTEN FIRMLY TOGETHER WITH TURNED-IN CUT ENDS OF WIRE MESH (EVERY TAB). TOP AND BOTTOM TABS ARE TO LOOP OVER AND AROUND THE HORIZONTAL WIRE TO PREVENT THE SEAM FROM SLIPPING

THREE (3) T-BAR STAKES EVENLY SPACED. INSTALL WITH FLAT SIDE OUT AS SHOWN

LOCATE OVERLAPPED JOINT BETWEEN T-BAR STAKES, AS SHOWN

ENSURE THAT THERE ARE NO SHARP EDGES OR PROTRUDING WIRES AT COMPLETION



**PLAN**

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SCHOOL GROUND  
STANDARD  
CONSTRUCTION  
DETAILS

DATE: JANUARY 2013

NOT TO SCALE

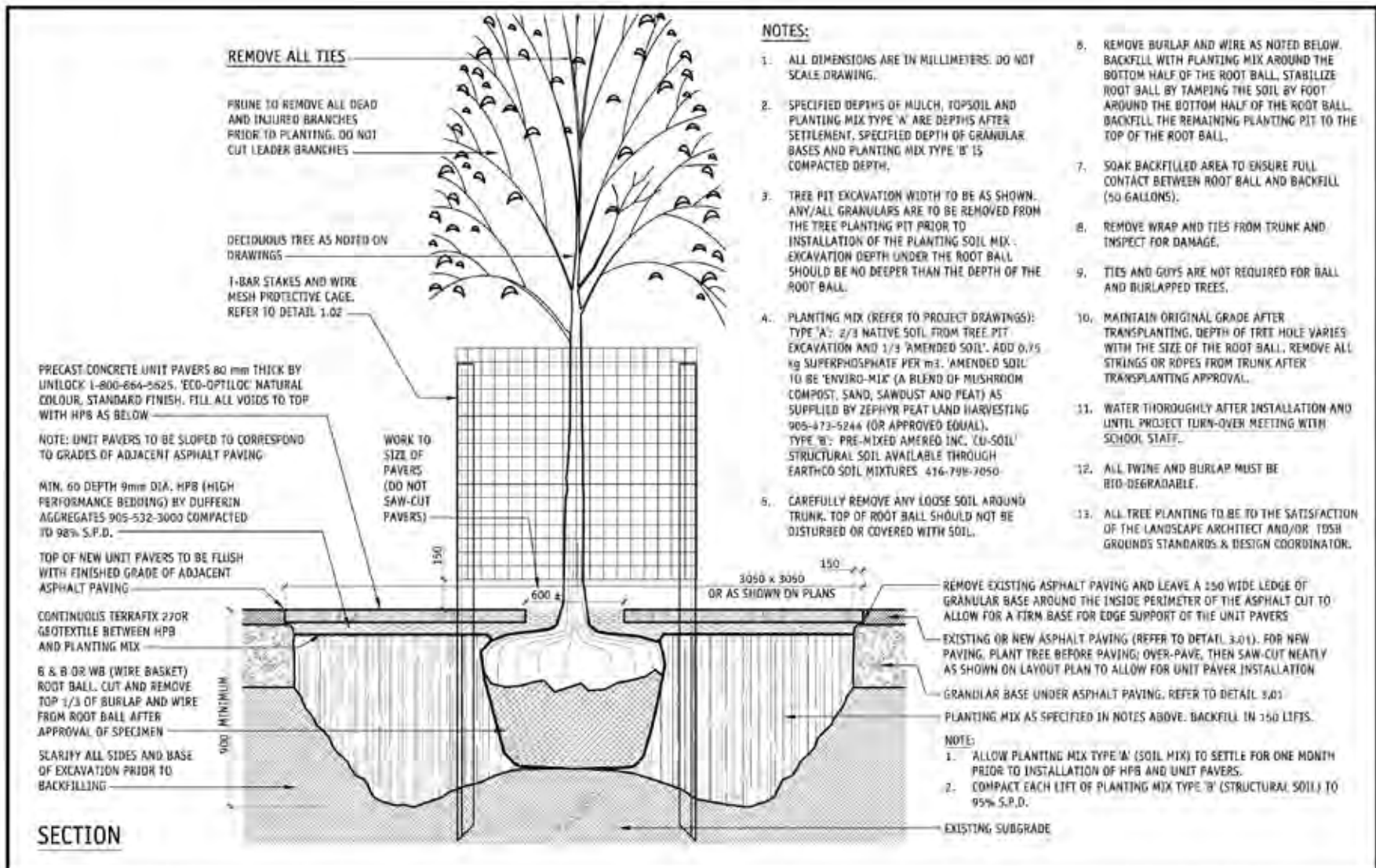
DRAWN BY: KIM ALLERTON DALA

CHECKED BY: BRUCE DAY

DETAIL #

PROTECTIVE TREE CAGE  
DECIDUOUS TREES

1.02

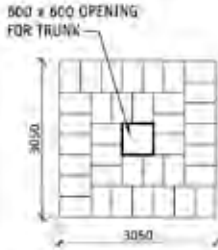


**NOTES:**

- ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
- SPECIFIED DEPTHS OF MULCH, TOPSOIL AND PLANTING MIX TYPE 'A' ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES AND PLANTING MIX TYPE 'B' IS COMPACTED DEPTH.
- TREE PIT EXCAVATION WIDTH TO BE AS SHOWN. ANY/ALL GRANULARS ARE TO BE REMOVED FROM THE TREE PLANTING PIT PRIOR TO INSTALLATION OF THE PLANTING SOIL MIX. EXCAVATION DEPTH UNDER THE ROOT BALL SHOULD BE NO DEEPER THAN THE DEPTH OF THE ROOT BALL.
- PLANTING MIX (REFER TO PROJECT DRAWINGS):  
TYPE 'A': 2/3 NATIVE SOIL FROM TREE PIT EXCAVATION AND 1/3 'AMENDED SOIL'. ADD 0.75 kg SUPERPHOSPHATE PER m<sup>3</sup>. 'AMENDED SOIL' TO BE 'ENVIRO-MIX' (A BLEND OF MUSHROOM COMPOST, SAND, SAWDUST AND PEAT) AS SUPPLIED BY ZEPHYR PEAT LAND HARVESTING 905-473-5244 (OR APPROVED EQUAL).  
TYPE 'B': PRE-MIXED AMERED INC. 'CO-SOIL' STRUCTURAL SOIL AVAILABLE THROUGH EARTHCO SOIL MIXTURES 416-798-7050
- CAREFULLY REMOVE ANY LOOSE SOIL AROUND TRUNK. TOP OF ROOT BALL SHOULD NOT BE DISTURBED OR COVERED WITH SOIL.
- 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.
- SOAK BACKFILLED AREA TO ENSURE FULL CONTACT BETWEEN ROOT BALL AND BACKFILL (50 GALLONS).
- REMOVE WRAP AND TIES FROM TRUNK AND INSPECT FOR DAMAGE.
- TIES AND GUYS ARE NOT REQUIRED FOR BALL AND BURLAPPED TREES.
- 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.
- WATER THOROUGHLY AFTER INSTALLATION AND UNTIL PROJECT TURN-OVER MEETING WITH SCHOOL STAFF.
- ALL TWINE AND BURLAP MUST BE BIO-DEGRADABLE.
- ALL TREE PLANTING TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TOSB GROUNDS STANDARDS & DESIGN COORDINATOR.

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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>DECIDUOUS TREE PLANTING PERMEABLE UNIT PAVING</b>				<b>1.11</b>



SAW-CUT SQUARE IN EXISTING ASPHALT PAVING TO BE 3050 x 3050

**PLAN**

PRECAST CONCRETE GRID PAVERS (CGP): 400 x 600 x 80 mm THICK BY UNILOCK 1-800-866-5625, 'TURFSTONE' NATURAL COLOUR, STANDARD FINISH. FILL ALL VOIDS TO TOP WITH HPB AS BELOW

NOTE: CONCRETE GRID PAVERS TO BE SLOPED TO CORRESPOND TO GRADES OF ADJACENT ASPHALT PAVING

MIN. 60 DEPTH 9mm DIA. HPB (HIGH PERFORMANCE BEDDING) BY DUFFERIN AGGREGATES 905-532-3000 COMPACTED TO 98% S.P.D.

TOP OF NEW UNIT PAVERS TO BE FLUSH WITH FINISHED GRADE OF ADJACENT ASPHALT PAVING

CONTINUOUS TERRAFIX 270R GEOTEXTILE BETWEEN HPB AND PLANTING MIX

6 & 8 OR WB (WIRE BASKET) ROOT BALL. CUT AND REMOVE TOP 1/3 OF BURLAP AND WIRE FROM ROOT BALL AFTER APPROVAL OF SPECIMEN

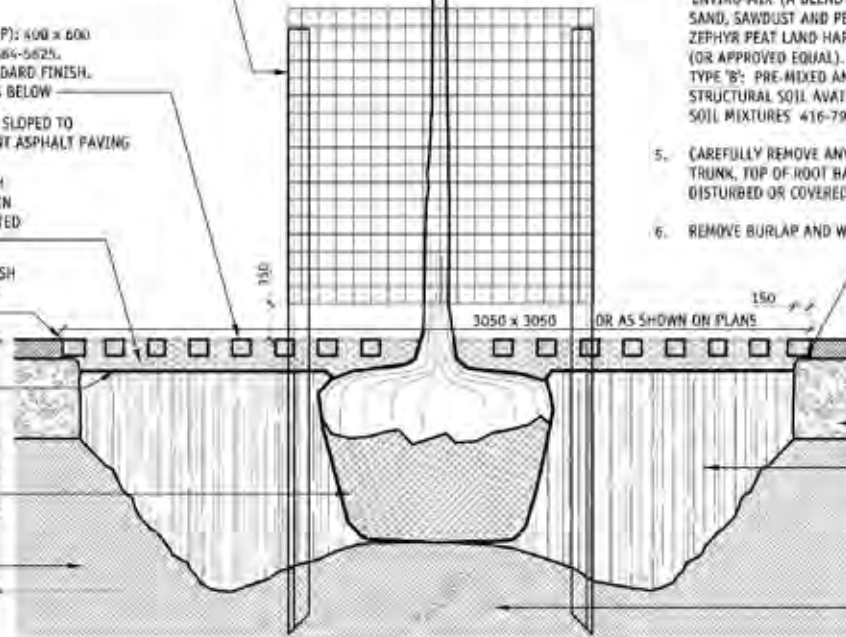
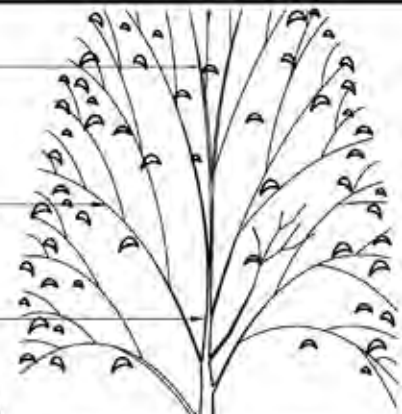
SLURRY ALL SIDES AND BASE OF EXCAVATION PRIOR TO BACKFILLING

REMOVE ALL TIES

PRUNE TO REMOVE ALL DEAD AND INJURED BRANCHES PRIOR TO PLANTING. DO NOT CUT LEADER BRANCHES

DECIDUOUS TREE AS NOTED ON DRAWINGS

T-BAR STAKES AND WIRE MESH PROTECTIVE CAGE. REFER TO DETAIL 1.02



REMOVE EXISTING ASPHALT PAVING AND LEAVE A 150 WIDE LEDGE OF GRANULAR BASE AROUND THE INSIDE PERIMETER OF THE ASPHALT CUT TO ALLOW FOR A FIRM BASE FOR EDGE SUPPORT OF THE CGP

EXISTING OR NEW ASPHALT PAVING (REFER TO DETAIL 3.01). FOR NEW PAVING, PLANT TREE BEFORE PAVING; OVER-PAVE, THEN SAW-CUT NEATLY AS SHOWN ON LAYOUT PLAN TO ALLOW FOR INSTALLATION OF CONCRETE GRID PAVERS

GRANULAR BASE UNDER ASPHALT PAVING. REFER TO DETAIL 3.01

PLANTING MIX AS SPECIFIED IN NOTES ABOVE. BACKFILL IN 150 LIFTS.

NOTE:

1. ALLOW PLANTING MIX TYPE 'A' (SOIL MIX) TO SETTLE FOR ONE MONTH PRIOR TO INSTALLATION OF HPB AND UNIT PAVERS.
2. COMPACT EACH LIFT OF PLANTING MIX TYPE 'B' (STRUCTURAL SOIL) TO 98% S.P.D.

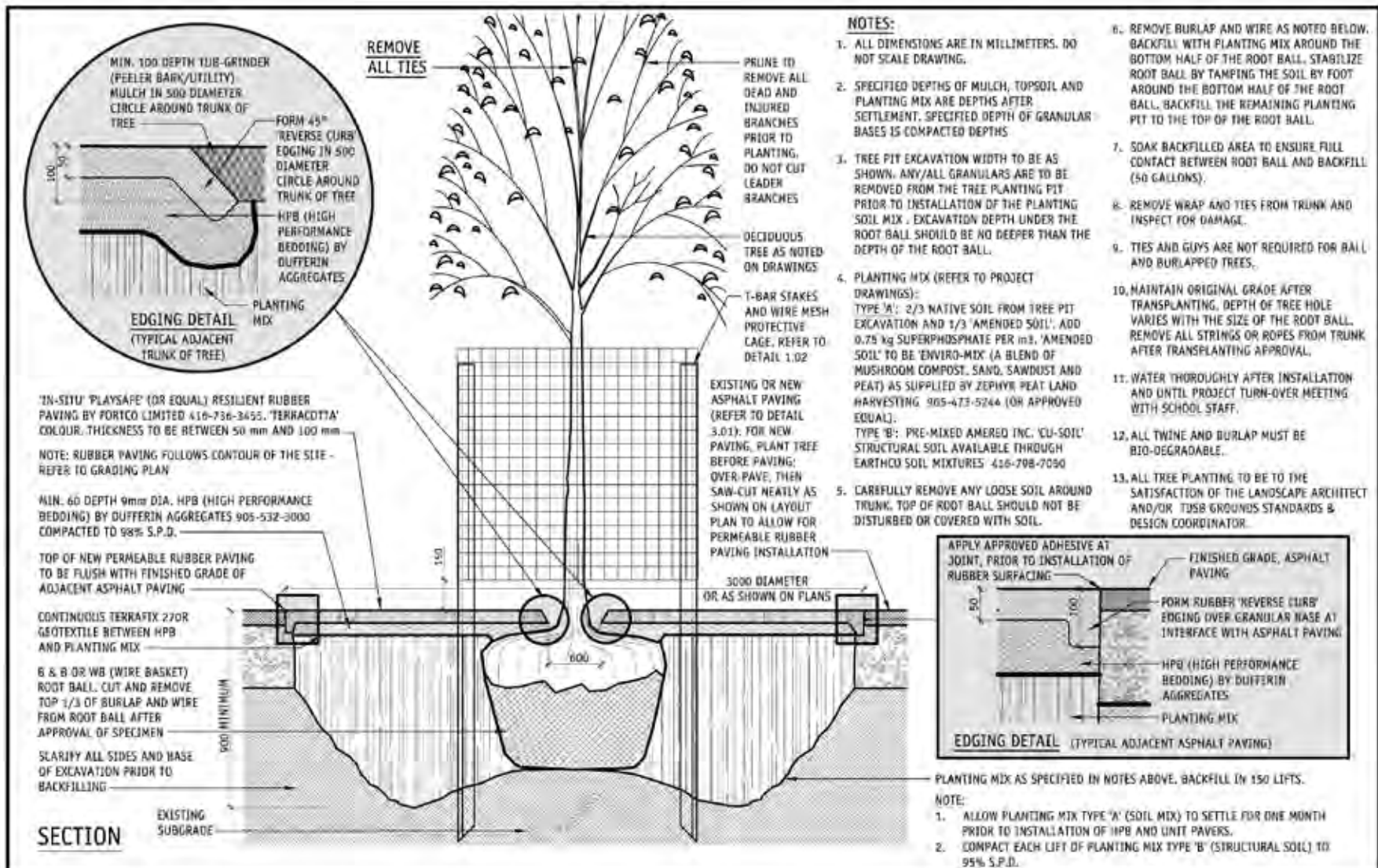
EXISTING SUBGRADE

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS. DO NOT SCALE DRAWING.
2. SPECIFIED DEPTHS OF MULCH, TOPSOIL AND PLANTING MIX TYPE 'A' ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASES AND PLANTING MIX TYPE 'B' IS COMPACTED DEPTH.
3. TREE PIT EXCAVATION WIDTH TO BE AS SHOWN. ANY/ALL GRANULARS ARE TO BE REMOVED FROM THE TREE PLANTING PIT PRIOR TO INSTALLATION OF THE PLANTING SOIL MIX. EXCAVATION DEPTH UNDER THE ROOT BALL SHOULD BE NO DEEPER THAN THE DEPTH OF THE ROOT BALL.
4. PLANTING MIX (REFER TO PROJECT DRAWINGS):  
TYPE 'A': 2/3 NATIVE SOIL FROM TREE PIT EXCAVATION AND 1/3 'AMENDED SOIL'. ADD 0.75 kg SUPERPHOSPHATE PER m<sup>3</sup>. 'AMENDED SOIL' TO BE 'ENVIRO-MIX' (A BLEND OF MUSHROOM COMPOST, SAND, SAWDUST AND PEAT) AS SUPPLIED BY ZEPHYR PEAT LAND HARVESTING 905-673-5244 (OR APPROVED EQUAL).  
TYPE 'B': PRE-MIXED AMERED INC. 'CU-SOIL' STRUCTURAL SOIL AVAILABLE THROUGH EARTHCO SOIL MIXTURES 416-798-7050
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.
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. ALL TWINE AND BURLAP MUST BE BIO-DEGRADABLE.
13. ALL TREE PLANTING TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p><b>DECIDUOUS TREE PLANTING CONCRETE GRID PAVING</b></p>				<p><b>1.12</b></p>



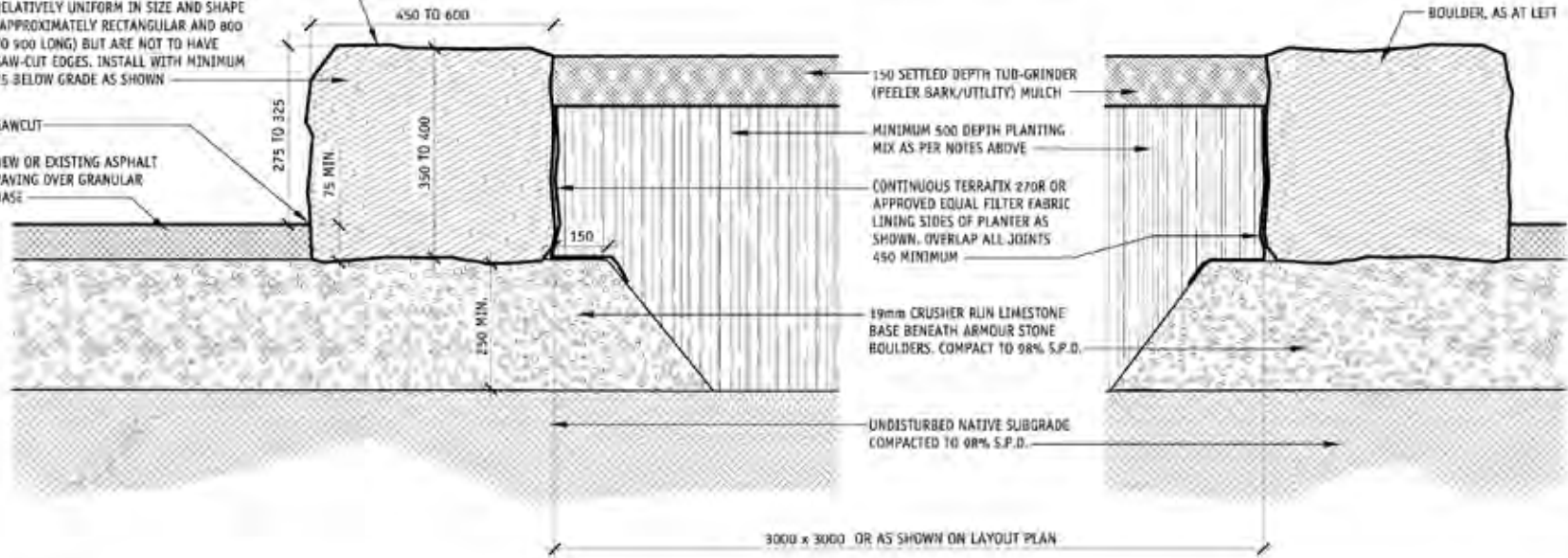
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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>DECIDUOUS TREE PLANTING POURED-IN-PLACE RUBBER PAVING</b>				<b>1.13</b>

TOP OF EACH SECTION OF PLANTER WALL TO BE INSTALLED LEVEL AT ONE CONSTANT ELEVATION. ADJUST ELEVATION OF GRANULAR BASE AS REQUIRED. OBTAIN LANDSCAPE ARCHITECTS AND/OR TOSB GROUNDS STANDARDS & DESIGN COORDINATOR'S APPROVAL OF AVERAGE HEIGHT PRIOR TO INSTALLATION

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 AND 800 TO 900 LONG) BUT ARE NOT TO HAVE SAW-CUT EDGES. INSTALL WITH MINIMUM 75 BELOW GRADE AS SHOWN

SAWCUT  
NEW OR EXISTING ASPHALT PAVING OVER GRANULAR BASE



**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 BASE IS COMPACTED DEPTH.
3. ENSURE THAT ANY SHARP CORNERS AND EDGES ON EXPOSED SIDES OF BOULDERS ARE ELIMINATED (ROUNDED) BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TOSB GROUNDS STANDARDS & DESIGN COORDINATOR.
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 TOSB GROUNDS STANDARDS & DESIGN COORDINATOR.
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. WHERE MORE THAN ONE PLANTER IS INSTALLED IN A LINEAR CONFIGURATION, USE A STRING LINE TO LAY OUT AND ALIGN (LINE UP) PLANTERS.
8. PLANTING MIX: APPROVED TRIPLE MIX, OR AS SPECIFIED BY THE LANDSCAPE ARCHITECT AND/OR TOSB GROUNDS STANDARDS & DESIGN COORDINATOR. ADD 0.75 kg SUPERPHOSPHATE PER m<sup>3</sup>.
9. DECIDUOUS TREE PLANTING IN PLANTER TO BE TO DETAIL 1.01 C/W PROTECTIVE CAGE TO DETAIL 1.02
10. PLANTER CONSTRUCTION TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TOSB GROUNDS STANDARDS & DESIGN COORDINATOR.

**SECTION**

HEIGHT OF PLANTER ILLUSTRATED ON THIS DETAIL IS APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>PLANTER ARMOUR STONE - KINDERGARTEN</b>				<b>1.21</b>

PRECAST CONCRETE PLANTER TO BE CONSTRUCTED OF 'FIELDSTONE' TUMBLED PRECAST CONCRETE BLOCKS, 'SANDSTONE' COLOUR, BY DAKS CONCRETE PRODUCTS 905-843-7335 OR ALTERNATE PRODUCT AS SPECIFIED ON THE PROJECT DRAWINGS

TOP OF EACH SECTION OF PLANTER WALL TO BE INSTALLED LEVEL AT ONE CONSTANT ELEVATION. ADJUST ELEVATION OF GRANULAR BASE AS REQUIRED. OBTAIN LANDSCAPE ARCHITECT'S AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR'S APPROVAL OF NUMBER OF COURSES EXPOSED PRIOR TO INSTALLATION

'FIELDSTONE' COPING UNIT, SAW-CUT AS REQUIRED TO ACHIEVE LAP JOINT SQUARE CORNERS

'FIELDSTONE' 135 mm THICK #3 AND #4 STANDARD UNITS (EVEN MIX); STAGGER JOINTS

NOTE: LAP JOINT ALL CORNERS

HF MASONRY ADHESIVE AS SUPPLIED BY DAKS TO BE USED BETWEEN ALL COURSES OF PRECAST CONCRETE PLANTER BLOCKS

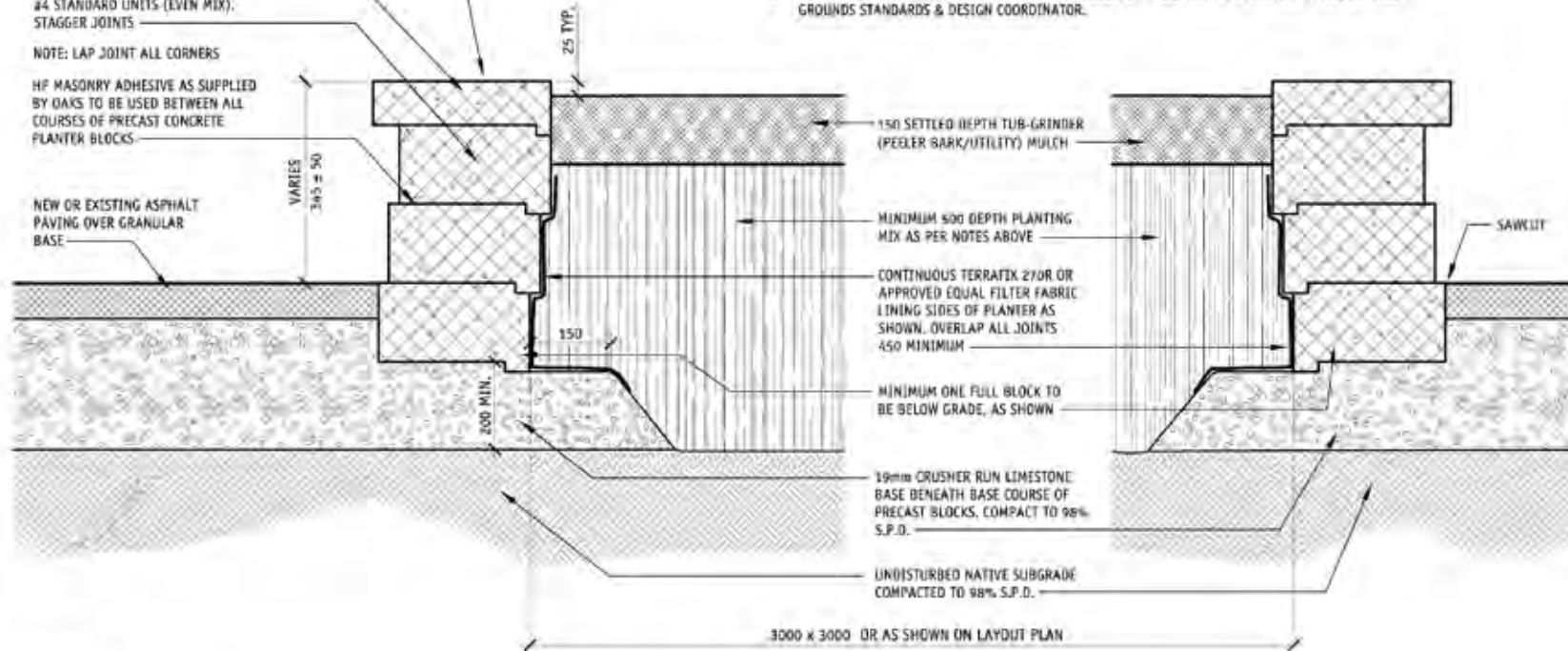
NEW OR EXISTING ASPHALT PAVING OVER GRANULAR BASE

VARIES 3x5 = 50

25 TYP.

**NOTES:**

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2. SPECIFIED DEPTHS OF MULCH, TOPSOIL AND PLANTING MIX ARE DEPTHS AFTER SETTLEMENT. SPECIFIED DEPTH OF GRANULAR BASE 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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR. ADD 0.25 kg SUPERPHOSPHATE PER m<sup>3</sup>.
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.



**SECTION**

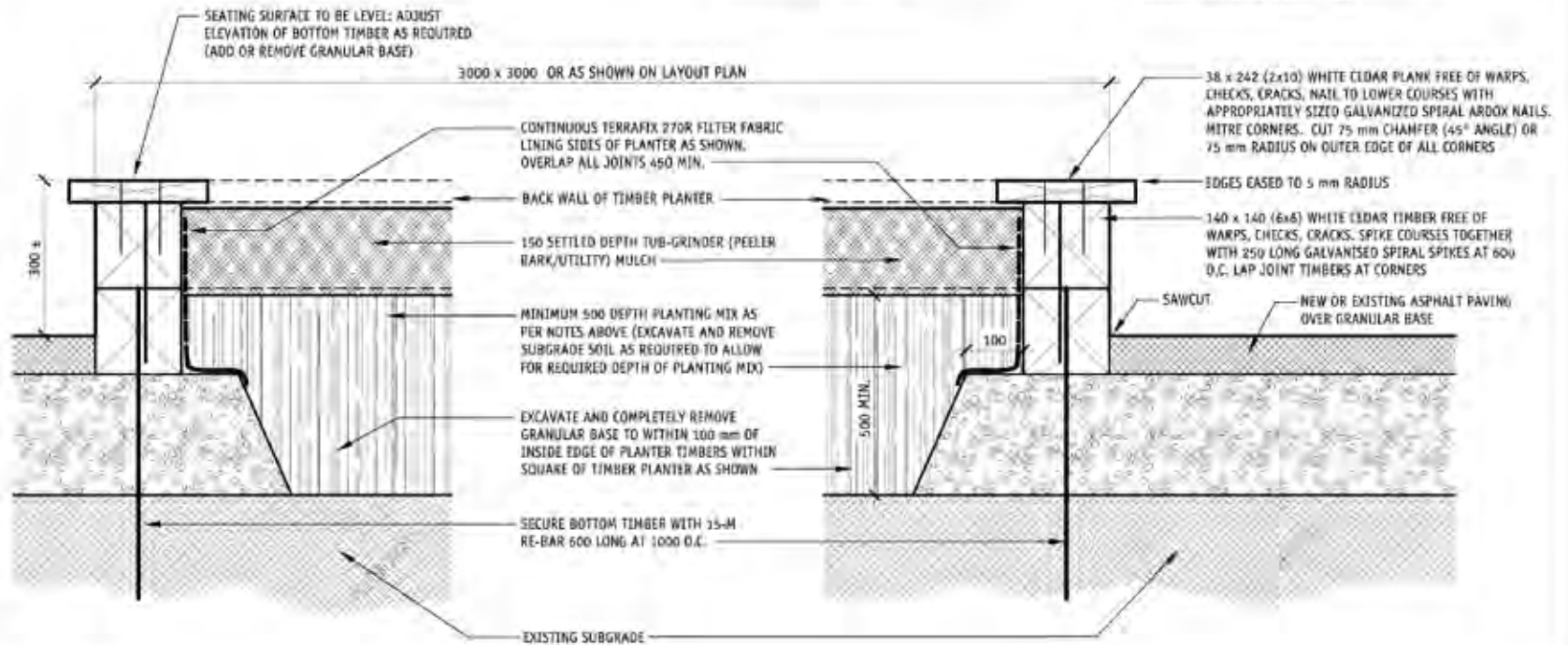
HEIGHT OF PLANTER ILLUSTRATED ON THIS DETAIL IS APPROPRIATE FOR KINDERGARTEN-AGE CHILDREN ONLY.

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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>PLANTER PRECAST CONCRETE - KINDERGARTEN</b>				<b>1.22</b>

**NOTES:**

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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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR. ADD 0.75 kg SUPERPHOSPHATE PER m<sup>2</sup>.
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.



**SECTION**

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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p><b>PLANTER TIMBER - KINDERGARTEN</b></p>				<p><b>1.23</b></p>

PRUNE TO REMOVE ALL LOW-HANGING, DEAD AND INJURED BRANCHES, DO NOT CUT LEADER BRANCHES

EXISTING DECIDUOUS TREE

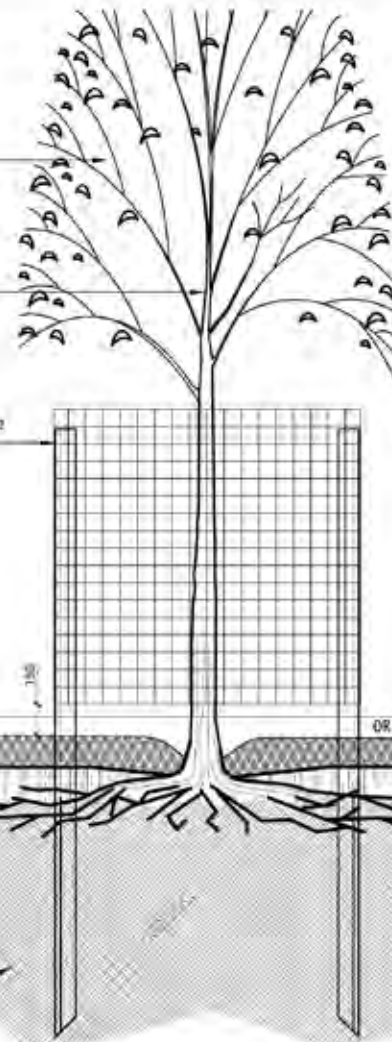
T-BAR STAKES AND WIRE MESH PROTECTIVE CAGE RECOMMENDED FOR ALL EXISTING TREES UNDER 150 DIAMETER. REFER TO DETAIL 1.02

150 SETTLED DEPTH TUB GRINDER (PEELER BARK/UTILITY) MULCH

SQUARE WOOD BENCH WITH METAL FRAMES TO DETAIL 1.32

DO NOT DAMAGE OR DISTURB ROOTS OF EXISTING TREE IN ANY WAY

EXISTING SUBSOIL



**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. SPECIFIED DEPTH OF GRANULAR BASES IS COMPACTED DEPTH.
3. BENCH INSTALLATION TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.
4. THIS DETAIL TO BE READ TOGETHER WITH DETAIL 1.32.

**WHERE EXISTING TREE IS SURROUNDED BY PAVING:**

5. REMOVE ANY EXISTING HARD SURFACING (TREE GRATES, CONCRETE GRID OR UNIT PAVERS) AND/OR SAW-CUT AND REMOVE EXISTING ASPHALT PAVING.
6. CAREFULLY (BY HAND) REMOVE EXISTING GRANULAR BASE TO WITHIN 200 mm OF NEW EDGE OF PAVING. DO NOT DAMAGE TREE ROOTS IN ANY WAY.
7. REPLACE REMOVED GRANULAR MATERIALS AND FILL TO TOP OF EXISTING ASPHALT PAVING WITH 'ENVIRO-MIX' (A BLEND OF MUSHROOM COMPOST, SAND, SAWDUST AND PEAT) AS SUPPLIED BY ZEPHYR PEAT LAND HARVESTING 905-479-5244 (OR APPROVED EQUAL). ADD 0.75 kg SUPERPHOSPHATE PER m<sup>3</sup>. TOP WITH MINIMUM 150 DEPTH TUB-GRINDER (PEELER BARK/UTILITY) MULCH AS SHOWN BELOW.

**WHERE EXISTING TREE IS SURROUNDED BY TURF:**

8. SKIN SOG WITH SOG-DIFFER.
9. DO NOT EXCAVATE OR REMOVE ANY TOPSOIL WITHIN DRIP LINE OF EXISTING TREE.

AMENDED 'ENVIRO-MIX' OR EXISTING TOPSOIL, AS NOTED ABOVE

EXISTING OR NEW ASPHALT PAVING (REFER TO DETAIL 3.01) FOR NEW PAVING. OVER-PAVE SLIGHTLY, THEN SAW-CUT NEATLY AS SHOWN ON LAYOUT PLAN TO ALLOW FOR NEW WOOD BENCH INSTALLATION

GRANULAR BASE UNDER ASPHALT PAVING. REFER TO DETAIL 3.01

**SECTION**

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SCHOOL GROUND  
STANDARD  
CONSTRUCTION  
DETAILS

DATE: JANUARY 2013

NOT TO SCALE

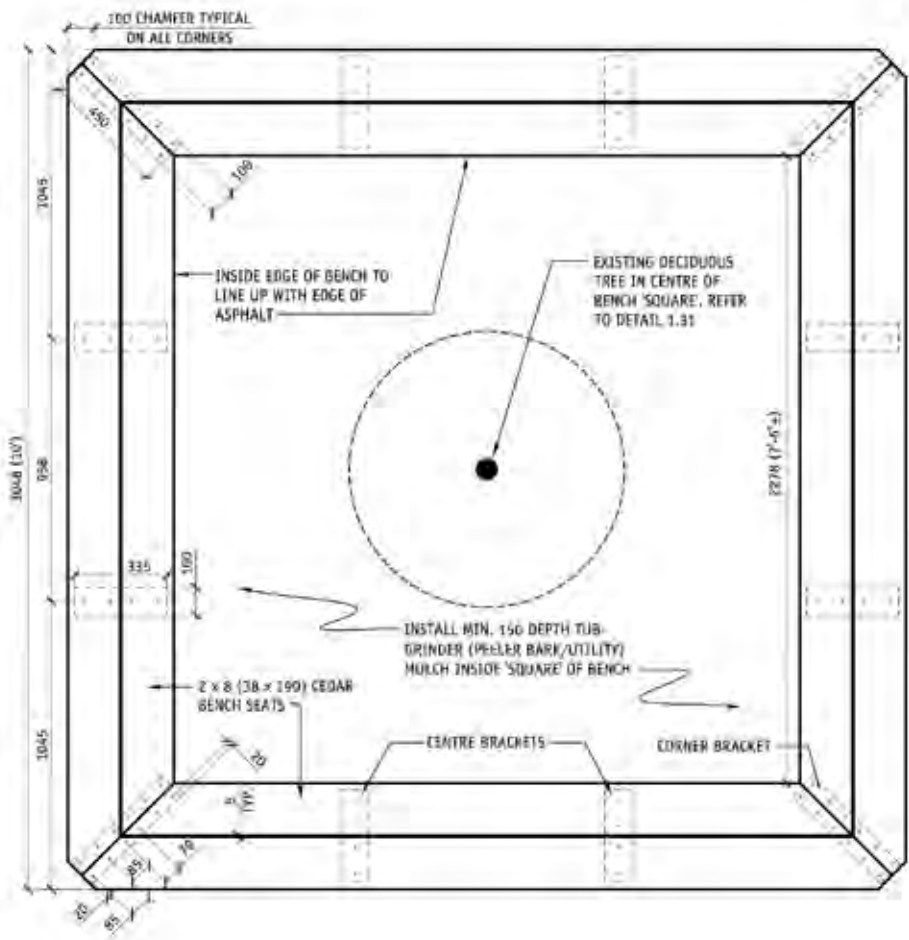
DRAWN BY: KIM ALLERTON OALA

CHECKED BY: BRUCE DAY

DETAIL #

**EXISTING DECIDUOUS TREE  
WITH NEW WOOD BENCH**

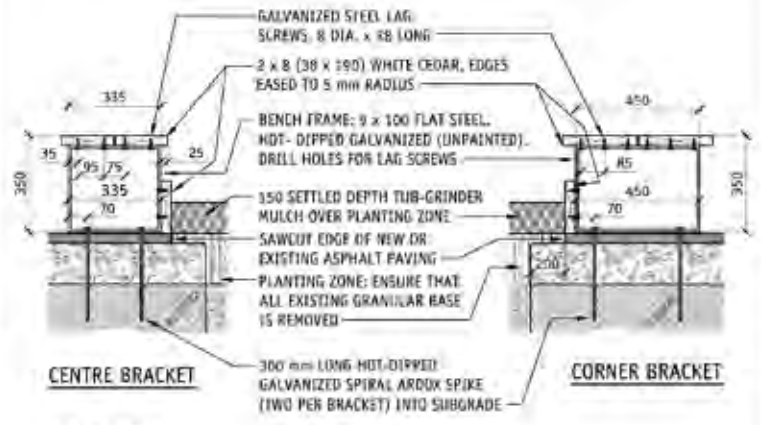
**1.31**



PLAN

**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. ALL GALVANIZED METAL FRAME COMPONENTS TO BE LEFT UNFINISHED (NO PAINT).
4. FRAME COMPONENTS SHALL BE ELECTRICALLY WELDED.
5. WOOD COMPONENTS TO BE LEFT UNFINISHED, ALL WOOD TO BE FREE OF WARPS, CHECKS AND CRACKS.
6. WHERE MORE THAN ONE SQUARE BENCH IS INSTALLED IN A LINEAR CONFIGURATION, USE A STRING LINE TO LAY OUT AND ALIGN (LINE UP) BENCHES.
7. ALL BENCHES SHOULD BE INSTALLED WITH SEATS LEVEL. UNUSUAL SITE CONDITIONS WILL REQUIRE DIRECTION FROM LANDSCAPE ARCHITECT AND/OR THE TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.
8. BENCH CONSTRUCTION AND INSTALLATION TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR THE TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.
9. THIS DETAIL TO BE READ TOGETHER WITH DETAIL 1.31



SECTION

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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON DALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>SQUARE WOOD BENCH AROUND EXISTING DECIDUOUS TREE IN PAVING</b>				<b>1.32</b>

**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

**REMOVE ANY AND ALL TIES**

**SHRUB PRUNING:**

REFER ALSO TO NOTES AT RIGHT

PRUNE TO REMOVE ALL DEAD AND INJURED BRANCHES PRIOR TO PLANTING

PRUNE TO REMOVE ALL CROSSING AND OVERLAPPING BRANCHES

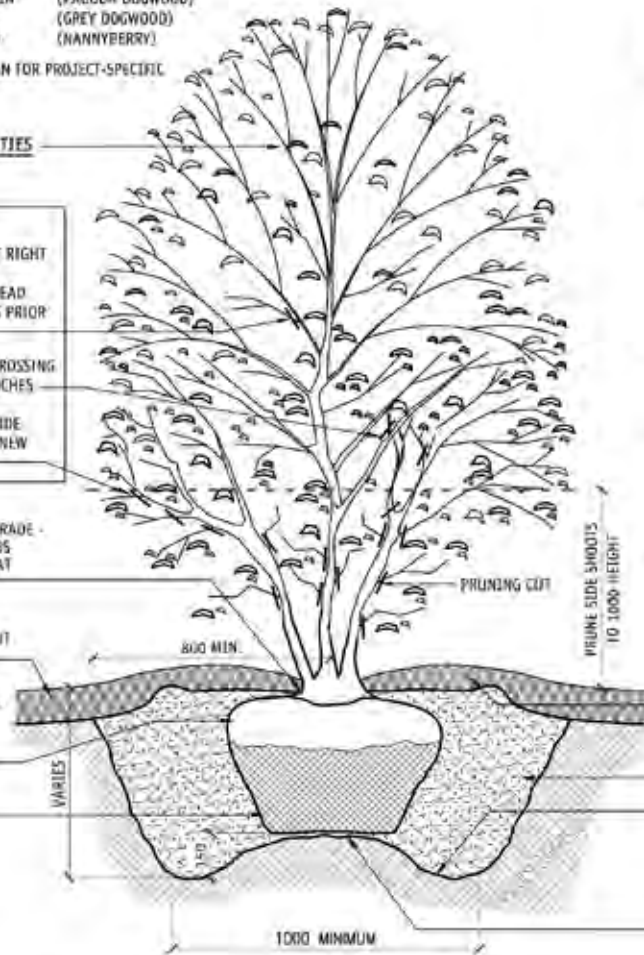
PRUNE TO REMOVE ALL SIDE SHOOTS TO 1000 ABOVE NEW FINISHED GRADE

APPROXIMATE EXISTING GRADE - PLANT MULTI-STEM SHRUBS WITH TOP OF ROOT BALL AT EXISTING GRADE

ADJACENT SURFACE TREATMENT AS PER LAYOUT PLAN (MULCH TYPICAL)

CUT AND REMOVE TOP 1/3 OF BURLAP AND WIRE FROM ROOT BALL AFTER APPROVAL OF SPECIMEN

WB (WIRE BASKET) ROOT BALL



**SECTION**

**NOTES:**

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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 m<sup>3</sup>. 'AMENDED SOIL' TO BE 'ENVIRO-MIX' (A BLEND OF MUSHROOM COMPOST, SAND, SAWDUST AND PEAT) AS SUPPLIED BY ZEPHYR PEAT LAND HARVESTING: 905-473-5244 (OR APPROVED EQUAL).
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 3000 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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

**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-Z634 LATEST EDITION) ARE TO BE REMOVED.

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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p><b>MULTI-STEM SPECIMEN SHRUB PLANTING AND PRUNING</b></p>				<p><b>1.41</b></p>

**WHERE BOULDERS ARE INSTALLED IN AREAS OF EXISTING GRASS:**

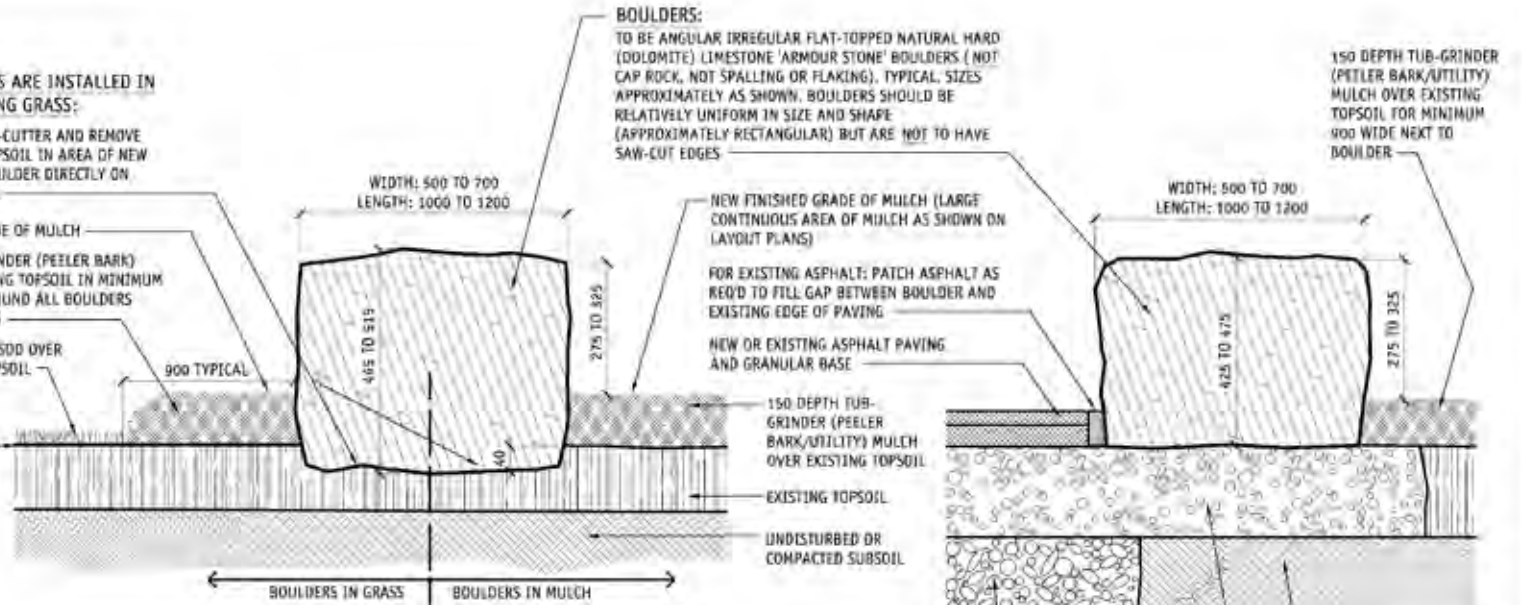
SKIN SOO WITH SOO-CUTTER AND REMOVE 40mm DEPTH OF TOPSOIL IN AREA OF NEW BOULDER. PLACE BOULDER DIRECTLY ON REMAINING TOPSOIL

NEW FINISHED GRADE OF MULCH

150 DEPTH TUB-GRINDER (PEELER BARK) MULCH OVER EXISTING TOPSOIL IN MINIMUM 900 WIDE BAND AROUND ALL BOULDERS INSTALLED IN GRASS

EXISTING GRASS OR SOO OVER MIN. 150 DEPTH TOPSOIL

FINISHED GRADE BEYOND 900 WIDE AREA OF MULCH



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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) BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE

- LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR. 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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

**SECTION**

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				<b>ARMOUR STONE SEATING SINGLE BOULDERS - KINDERGARTEN</b>				

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3. ENSURE THAT ANY SHARP CORNERS AND EDGES ON EXPOSED SIDES OF STONES ARE ELIMINATED (ROUNDED) BY GRINDING OR OTHER SIMILAR MEANS TO SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR. GAPS GREATER THAN 50mm WILL NOT BE ACCEPTED. FILL GAPS BETWEEN BOULDERS WITH SCREENINGS PRE-MIXED WITH "STABILIZER" BY ENVIROBOND 1-800-810-8218. MIX PROPORTIONS AS RECOMMENDED BY ENVIROBOND, OR FILL LARGE GAPS WITH HAND-PACKED ASPHALT PAVING, AS APPROPRIATE AND AS DIRECTED BY THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATION.

**BOULDERS:**

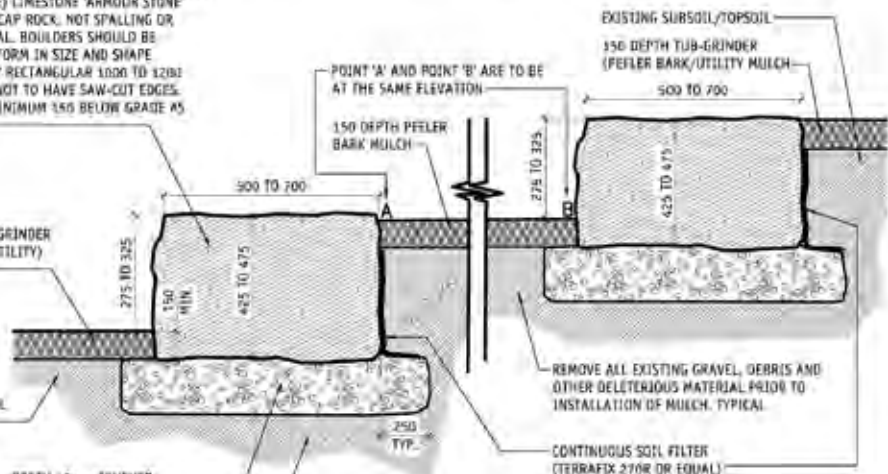
TO BE ANGULAR (IRREGULAR FLAT-TOPPED NATURAL HARD (DOLOMITE) LIMESTONE 'ARMOUR STONE' BOULDERS (NOT CAP ROCK, NOT SPALLING OR FLAKING). TYPICAL BOULDERS SHOULD BE RELATIVELY UNIFORM IN SIZE AND SHAPE (APPROXIMATELY RECTANGULAR 1000 TO 1200 LONG) BUT ARE NOT TO HAVE SAW-CUT EDGES. INSTALL WITH MINIMUM 150 BELOW GRADE AS SHOWN

150 DEPTH TUB-GRINDER (PEELER BARK/UTILITY) MULCH

EXISTING TOPSOIL OVER SUBSOIL

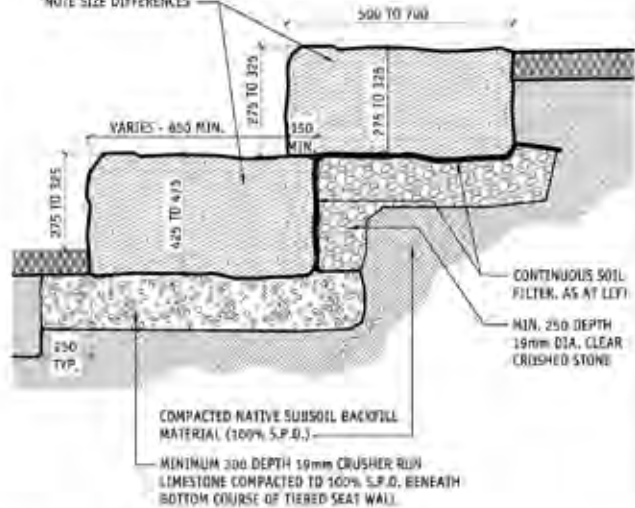
MINIMUM 250 mm DEPTH 19mm CRUSHER RUN LIMESTONE COMPACTED TO 100% S.P.D. BENEATH ALL ARMOUR STONE AS SHOWN

SUBBASE COMPACTED TO 98% S.P.D. TYPICAL



**BOULDERS:**

SAME AS PER NOTE AT LEFT. NOTE SIZE DIFFERENCES



**SECTION**

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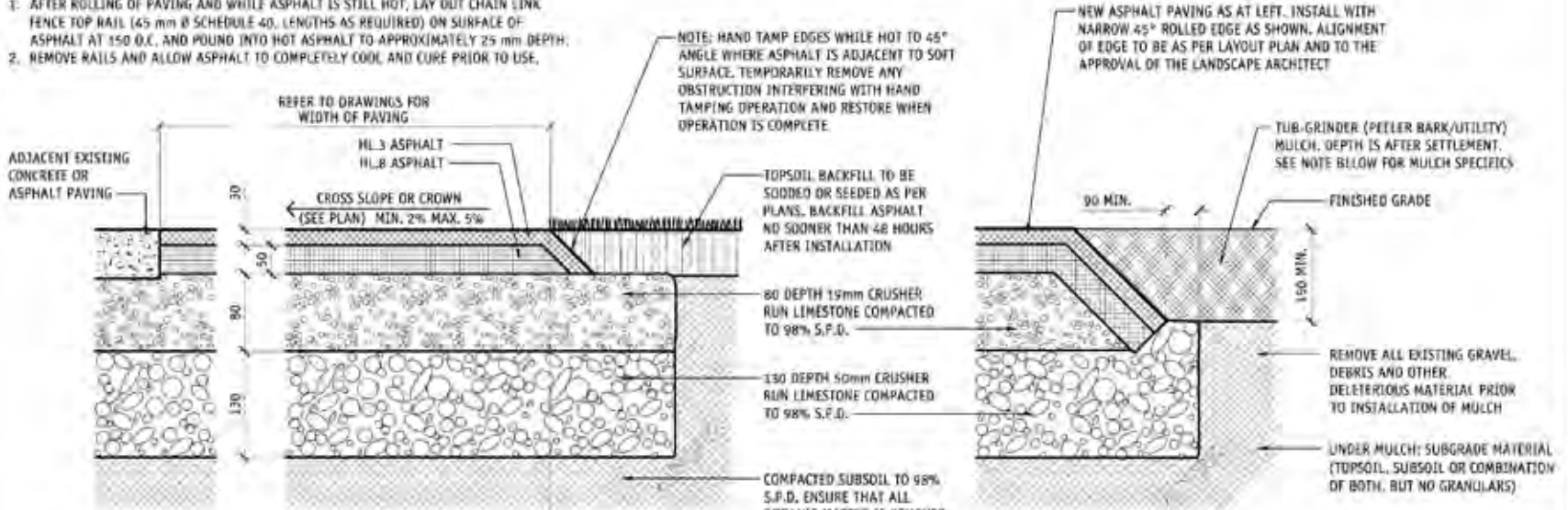
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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p><b>ARMOUR STONE SEATING TIERED - KINDERGARTEN</b></p>				<p><b>2.04</b></p>

**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% - 95% 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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

**ASPHALT/MULCH INTERFACE**

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

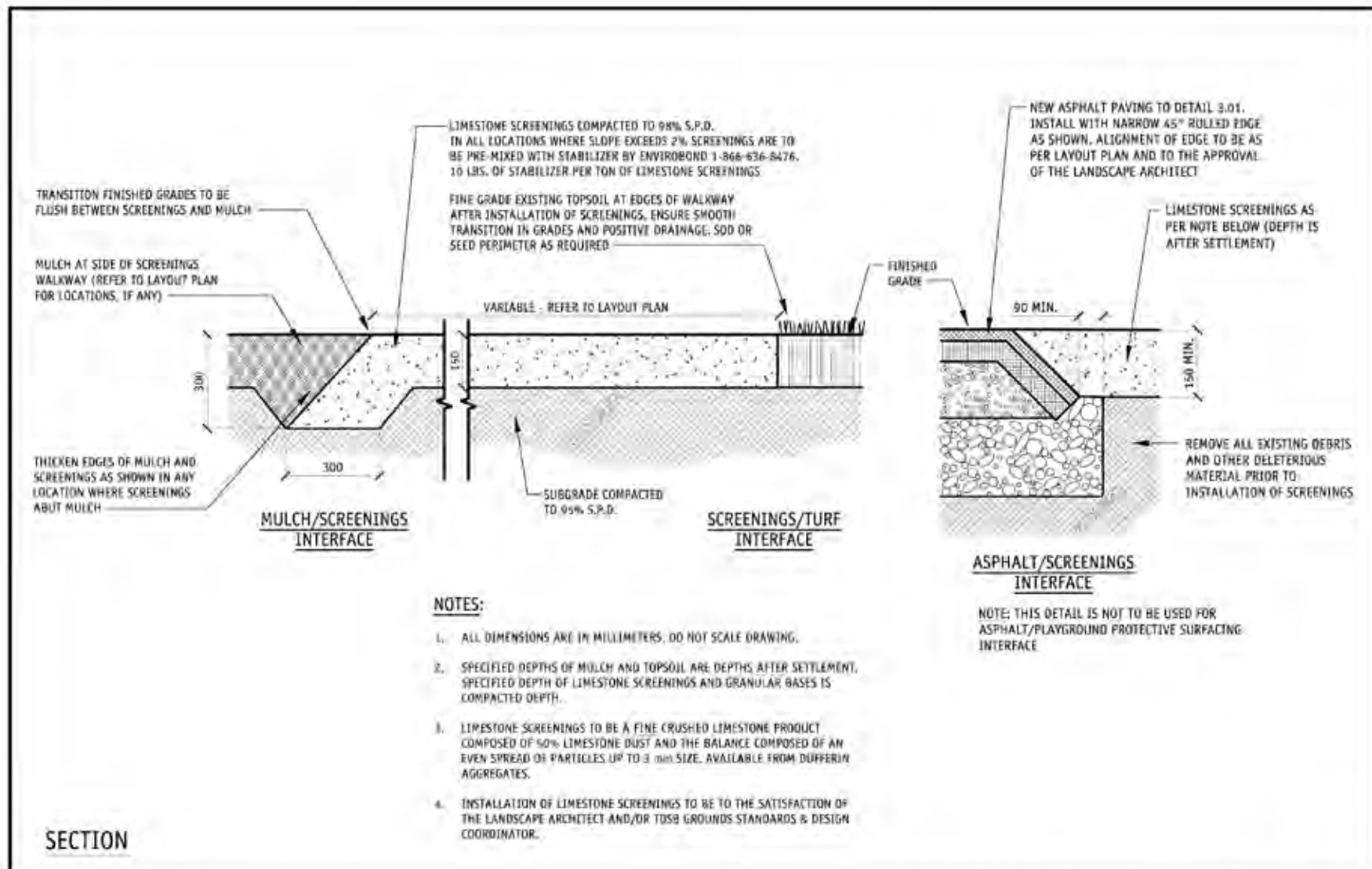
**'TUB-GRINDER' AND 'PEELER BARK' MULCH:**

TUB-GRINDER MULCH TO BE TWICE TUB-GROUND AND MAY BE OBTAINED THROUGH GRO-BARK 1-888-670-2275.  
 PEELER BARK MULCH TO BE SHREDDED BARK MULCH - THE MATERIAL (BARK) PEELLED OFF OF HARDWOOD LOGS AT A SAWMILL. PEELER BARK MULCH TO BE COMPRISED OF 90% BARK AND 10% WOOD AND MAY BE OBTAINED THROUGH ZEPHYR PEAT LAND HARVESTING 905-473-3244 OR OTHER APPROVED SUPPLIER(S).

**SECTION**

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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p><b>ASPHALT PAVING MEDIUM DUTY</b></p>				<p><b>3.01</b></p>



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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON, DALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>LIMESTONE SCREENINGS WALKWAY</b>				

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

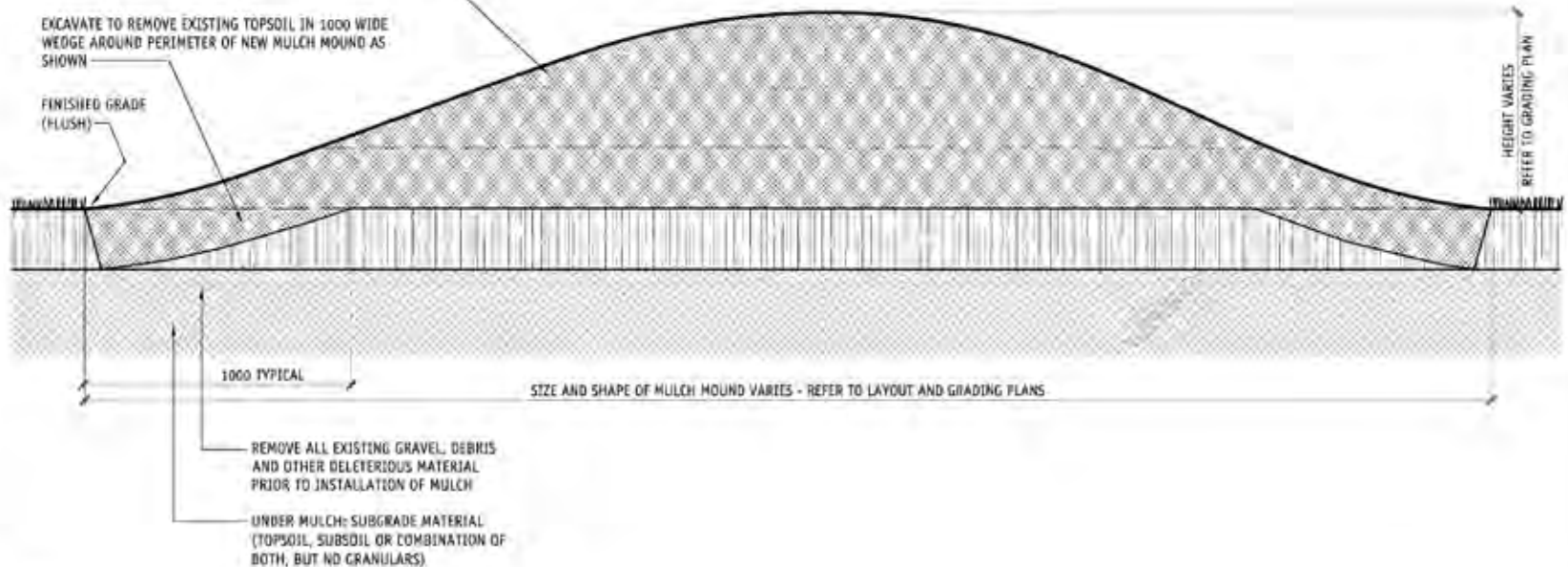
TUB-GRINDER MULCH TO BE TWICE TUB-GROUND AND MAY BE OBTAINED THROUGH GRO-BARK 1-888-470-2275.

PEELER BARK MULCH TO BE SHREDDED BARK MULCH - THE MATERIAL (BARK) PEELED OFF OF HARDWOOD LOGS AT A SAWMILL. PEELER BARK MULCH TO BE COMPRISED OF 90% BARK AND 10% WOOD AND MAY BE OBTAINED THROUGH ZEPHYR PEAT LAND HARVESTING 905-473-5244 OR OTHER APPROVED SUPPLIER(S)

INSTALL TUB-GRINDER MULCH IN 100 DEPTH LIFTS, PASS VIBRA-PLATE ROLLER OVER EACH LIFT TO COMPACT AND 'KNIT' MULCH FIBRES PRIOR TO INSTALLATION OF NEXT LIFT. ALTERNATELY (WITH APPROVAL OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR) RUN TRACTOR OR SKID LOADER IN TWO DIRECTIONS ACROSS EACH LIFT AS IT IS BEING INSTALLED

EXCAVATE TO REMOVE EXISTING TOPSOIL IN 1000 WIDE WEDGE AROUND PERIMETER OF NEW MULCH MOUND AS SHOWN

FINISHED GRADE (FLUSH)



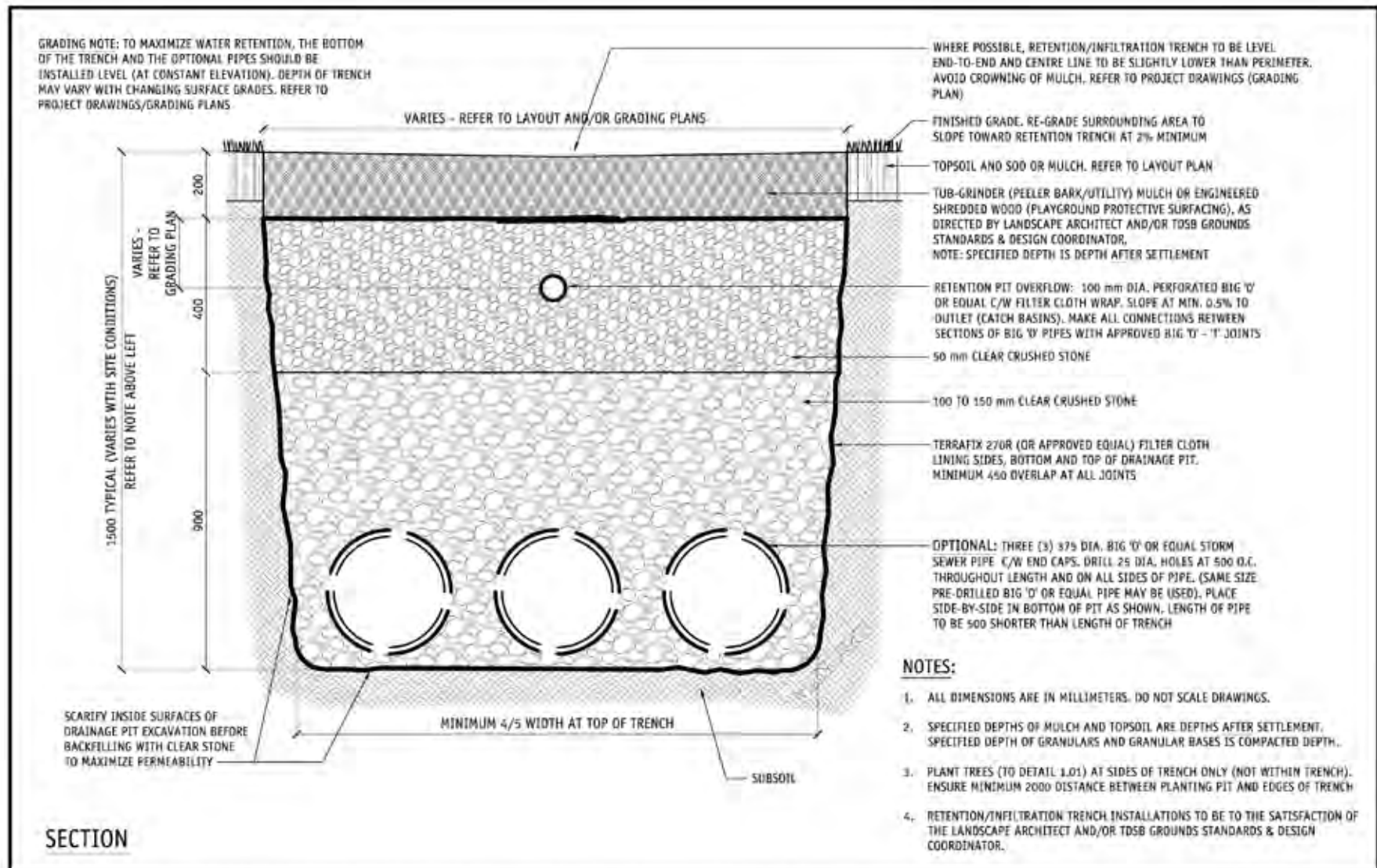
**NOTES:**

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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

**SECTION**

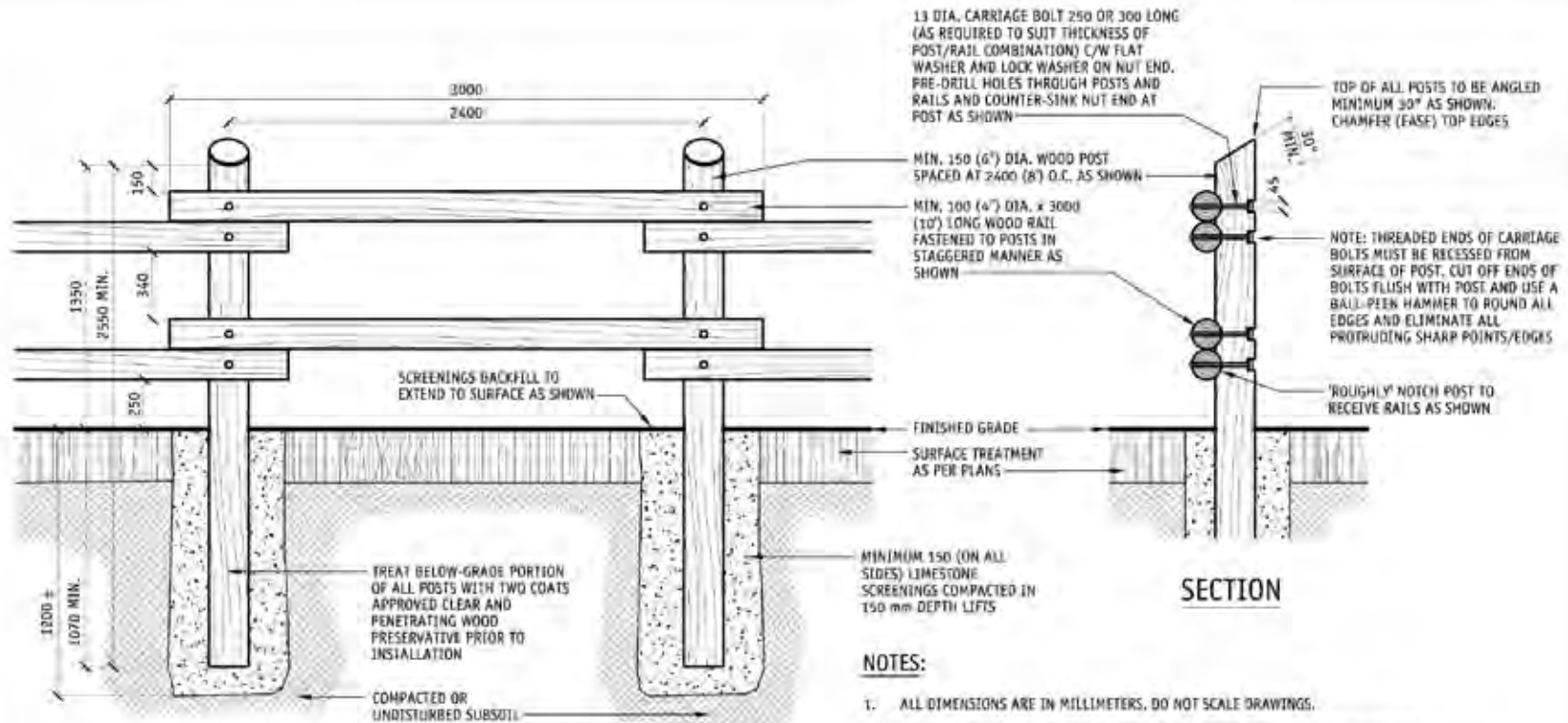
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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p>MULCH MOUND</p>				<p>3.04</p>



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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>RETENTION/INFILTRATION TRENCH MULCH SURFACE</b>				<b>3.11</b>



**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. AVAILABLE THROUGH BUTTON FENCE 705-458-9506
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>WOOD RAIL FENCE</b>				<b>4.01</b>

ENSURE THAT TOP OF FENCE COMPLIES WITH CAN/CSA-Z614 LATEST EDITION IN ALL RESPECTS, INCLUDING BUT NOT LIMITED TO INVERTED ANGLES, PARTIALLY BOUNDED OPENINGS (HEAD AND NECK ENTRAPMENT) AND ANY ENTANGLEMENT HAZARDS

LENGTH AS PER PLANS  
ALIGNMENT OF FENCE MAY BE CURVED AND/OR POSTS OFFSET WHERE INDICATED

TOP OF ALL POSTS TO BE ANGLED MINIMUM 30° AS SHOWN

ROUND WOOD POSTS (PEELED WHITE CEDAR) 200<sub>h</sub> DIA. PLACED VERTICALLY AND TIGHTLY BUTTED TOGETHER IN LAYOUT CONFIGURATION AS SHOWN ON PROJECT PLANS. ALTERNATE TAPERS 'ONE UP, ONE DOWN' TO ASSIST IN ACHIEVING TIGHT JOINTS. POSTS TO BE LIGHTLY SANDED WITH BELT SANDER PRIOR TO INSTALLATION. ENSURE ALL POSTS ARE FREE OF SPLINTERS, STABLE AND FREE OF MOVEMENT AFTER INSTALLATION

BEVEL TOP EDGES TO 10 mm RADIUS AND SAND SMOOTH

30° MIN.

SPIKE POSTS TOGETHER WITH 300 LONG HOT-DIPPED GALVANIZED ARDOX/SPIRAL SPIKES INSTALLED ON AN ANGLE THROUGH EACH POST AND INTO THE ADJACENT POST. START IN MIDDLE AND WORK TO ENDS OF FENCE. COUNTER-SINK SPIKES ON END POST(S)

TREAT BELOW-GRADE PORTION OF ALL POSTS WITH TWO COATS APPROVED CLEAR AND PENETRATING WOOD PRESERVATIVE PRIOR TO INSTALLATION

FINISHED GRADE

1200 MIN.

1070 MIN.

900 TO 1200  
AS NOTED ON LAYOUT PLAN

NOTE: WHERE USED AS PLAYGROUND PERIMETER FENCE, POST HEIGHT TO BE 1200 mm

SURFACE TREATMENT AS SPECIFIED ON LAYOUT PLAN(S). ASPHALT PAVING (LEFT) AND MULCH (RIGHT) IS ILLUSTRATED

MINIMUM 150 (ON ALL SIDES) LIMESTONE SCREENINGS BACKFILL COMPACTED IN 150 mm LIFTS

UNDISTURBED SUBSOIL

### 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. AVAILABLE THROUGH BUTON FENCE 705-658-9506
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 TDSB GROUNDS STANDARDS & DESIGN COORDINATION

SECTIONAL ELEVATION

SECTION

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SCHOOL GROUND  
STANDARD  
CONSTRUCTION  
DETAILS

DATE: JANUARY 2013

NOT TO SCALE

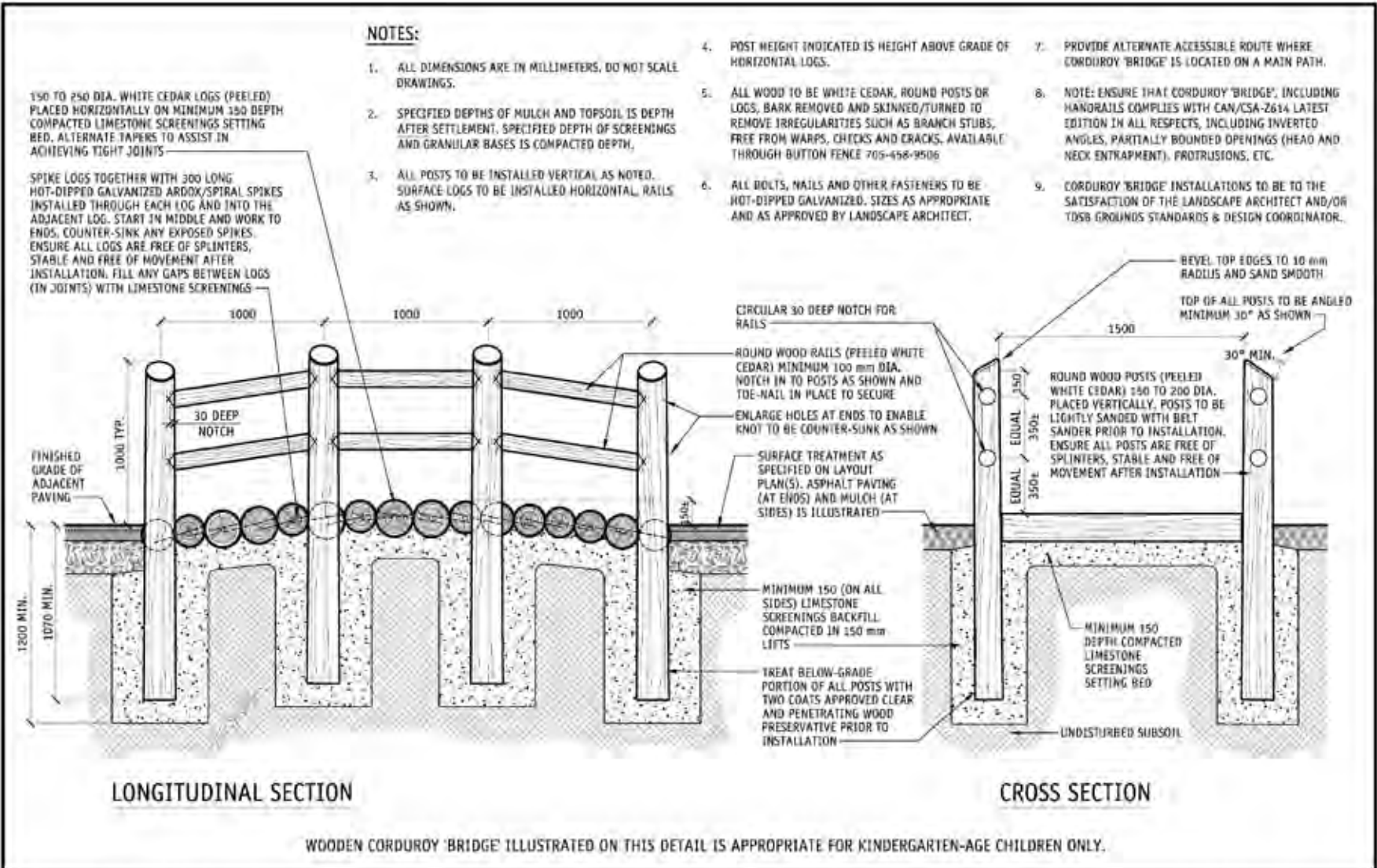
DRAWN BY: KIM ALLERTON: OALA

CHECKED BY: BRUCE DAY




DETAIL #

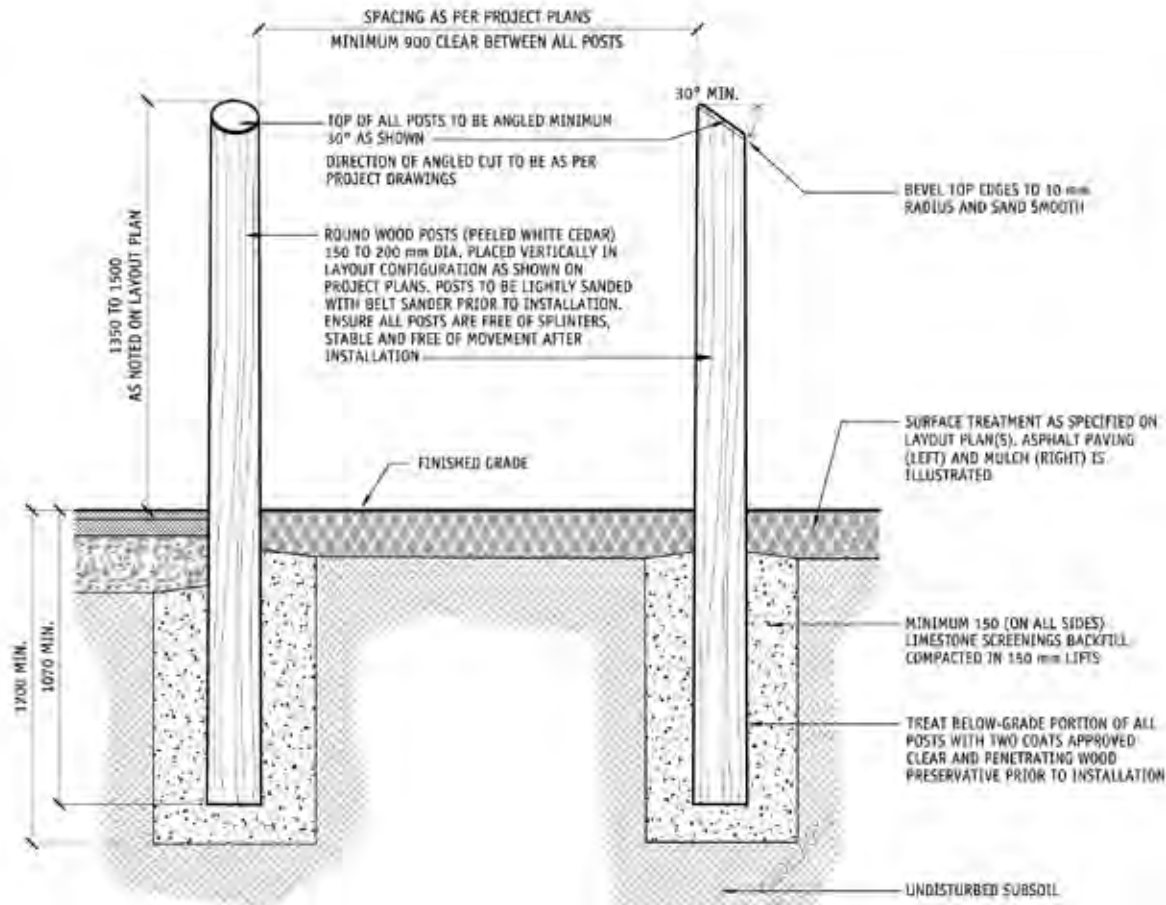
PALISADE POST FENCE

4.02



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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>CORDUROY 'BRIDGE'</b>				<b>5.01</b>



**NOTES:**

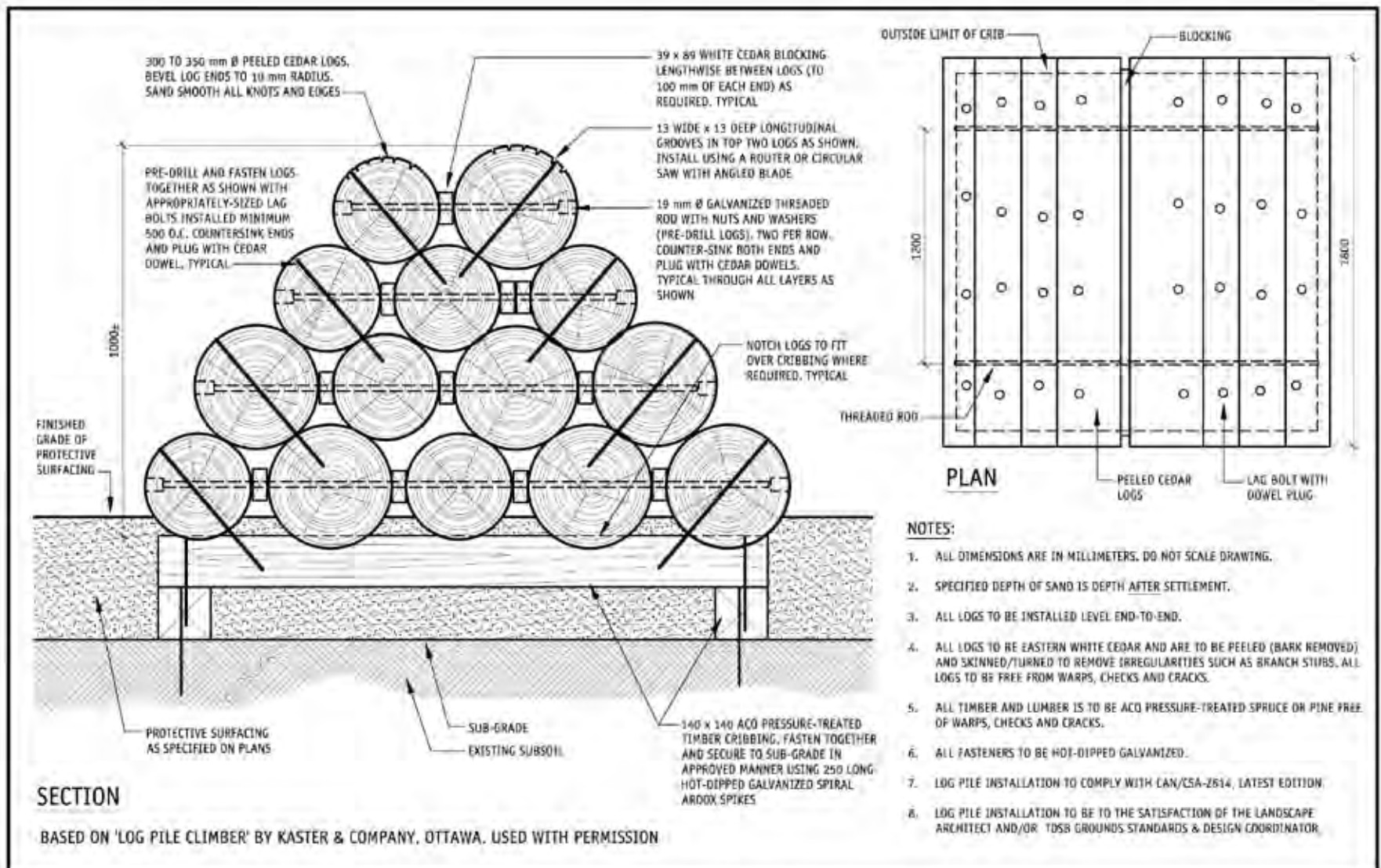
1. ALL DIMENSIONS ARE IN MILLIMETERS, DO NOT SCALE DRAWINGS.
2. SPECIFIED DEPTHS OF MULCH IS DEPTH AFTER SETTLEMENT. SPECIFIED DEPTH OF SCREENINGS AND GRANULAR BASES IS COMPACTED DEPTH.
3. ALL POSTS TO BE INSTALLED VERTICAL. VARY HEIGHTS AS INDICATED ON LAYOUT PLAN(S).
4. NUMBER OF POSTS VARIES, REFER 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. AVAILABLE THROUGH BUTTON FENCE 705-658-9506
6. PLAY POST INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

**SECTION**

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

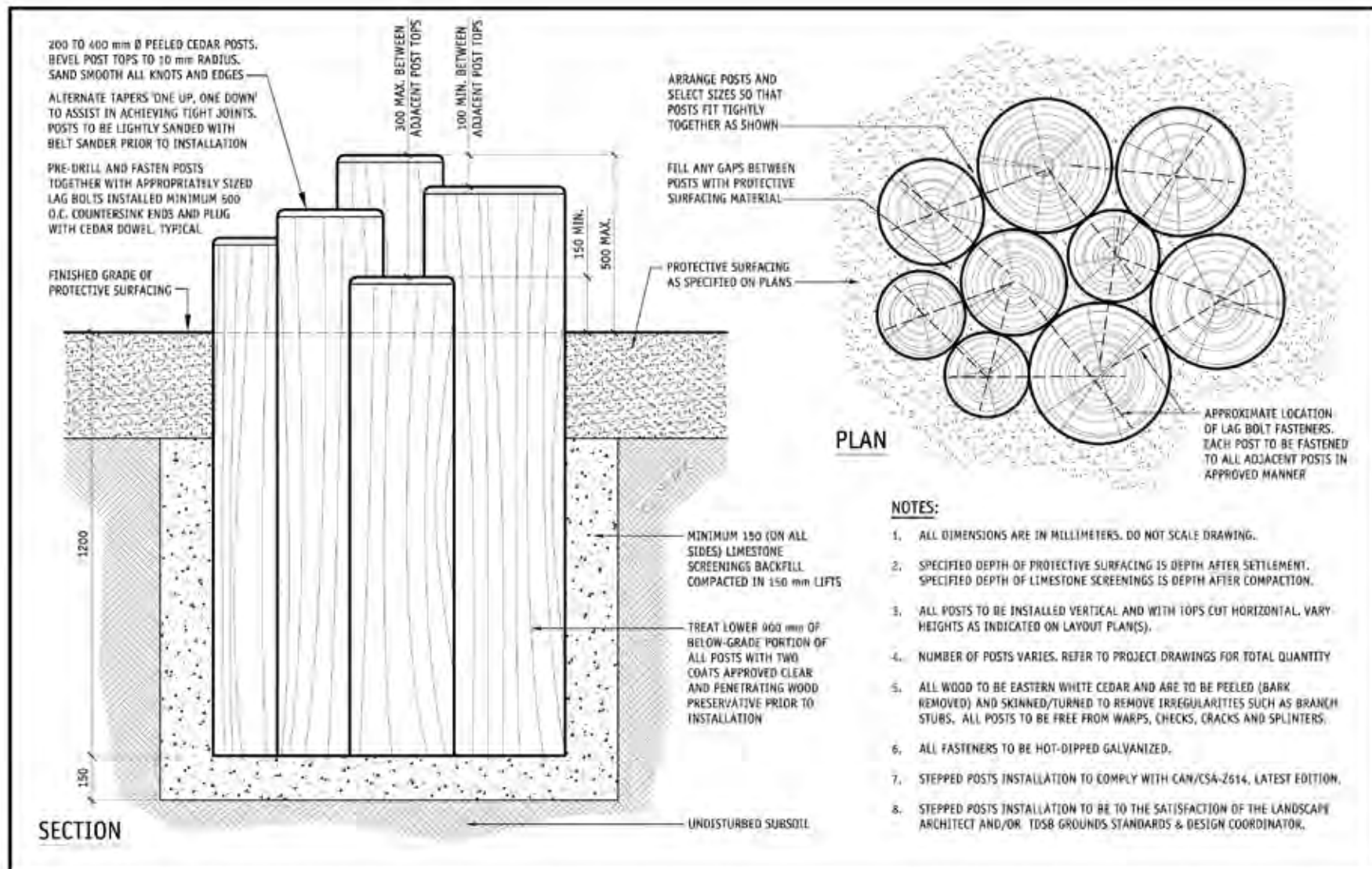
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			<p>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</p>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON DALA	CHECKED BY: BRUCE DAY	DETAIL #
				<p>PLAY POSTS</p>				<p>5.11</p>



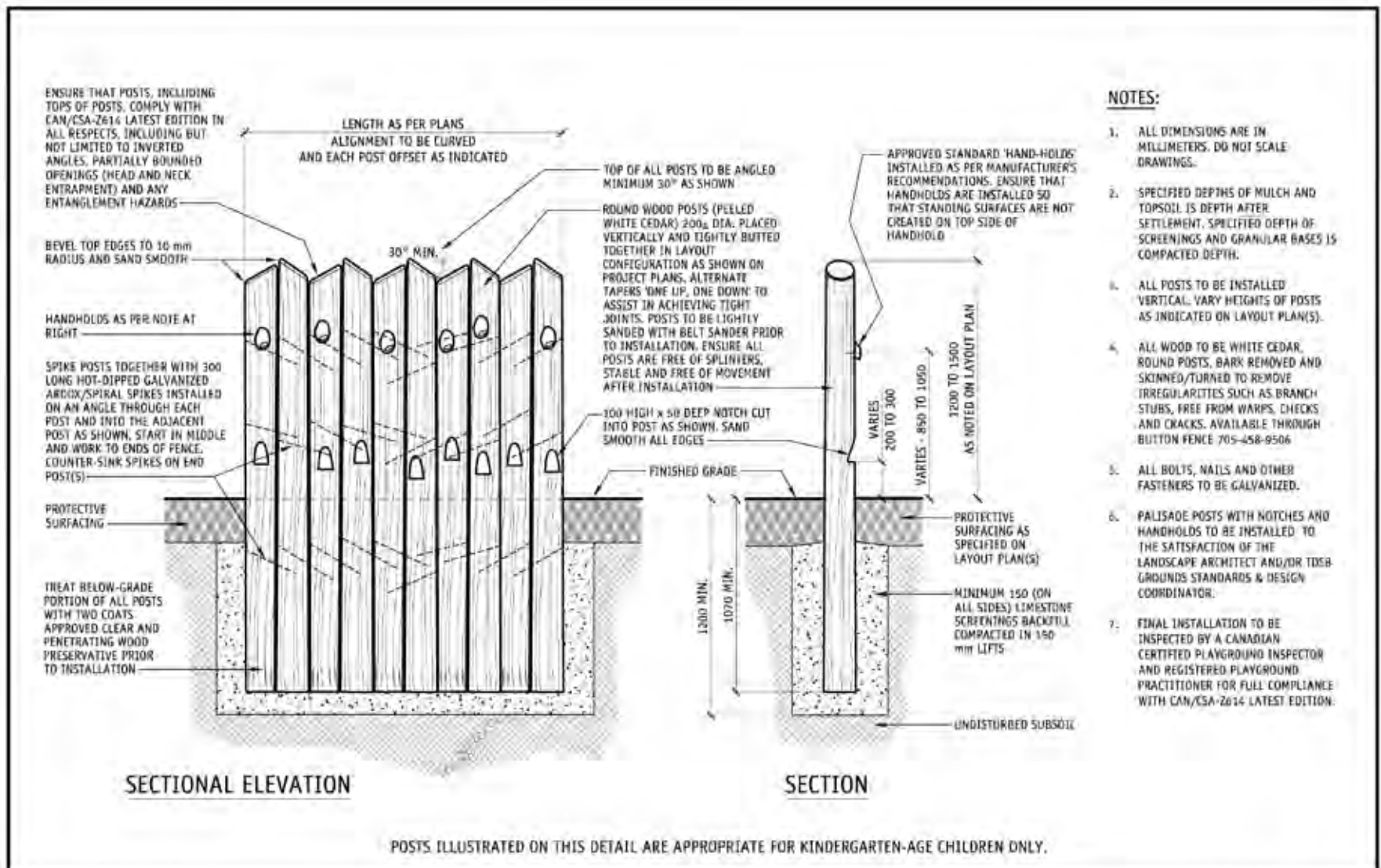
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				<b>LOG PILE CLIMBER KINDERGARTEN</b>				<b>5.13</b>



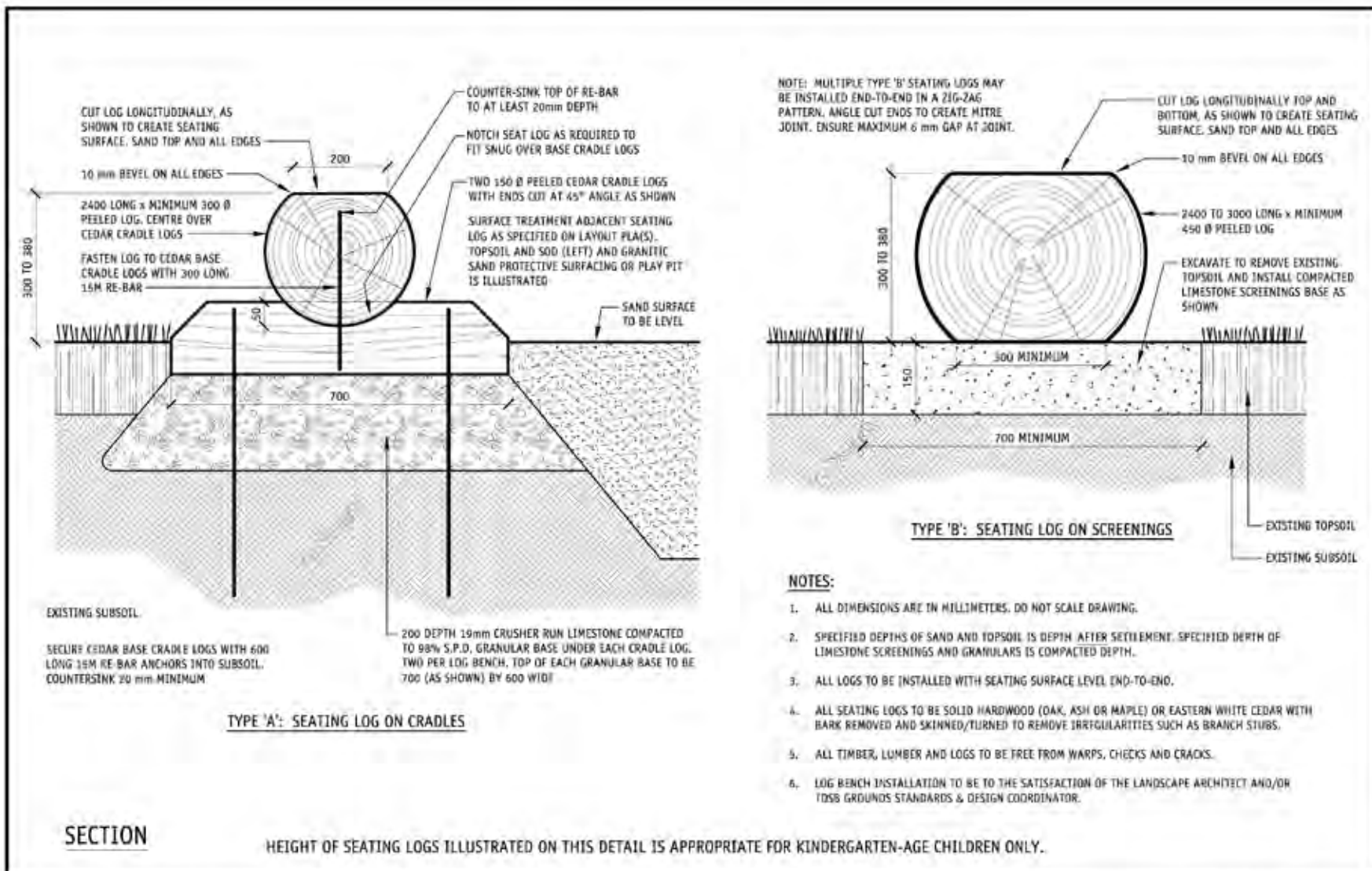
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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON DALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>STEPPED POSTS KINDERGARTEN</b>				<b>5.14</b>



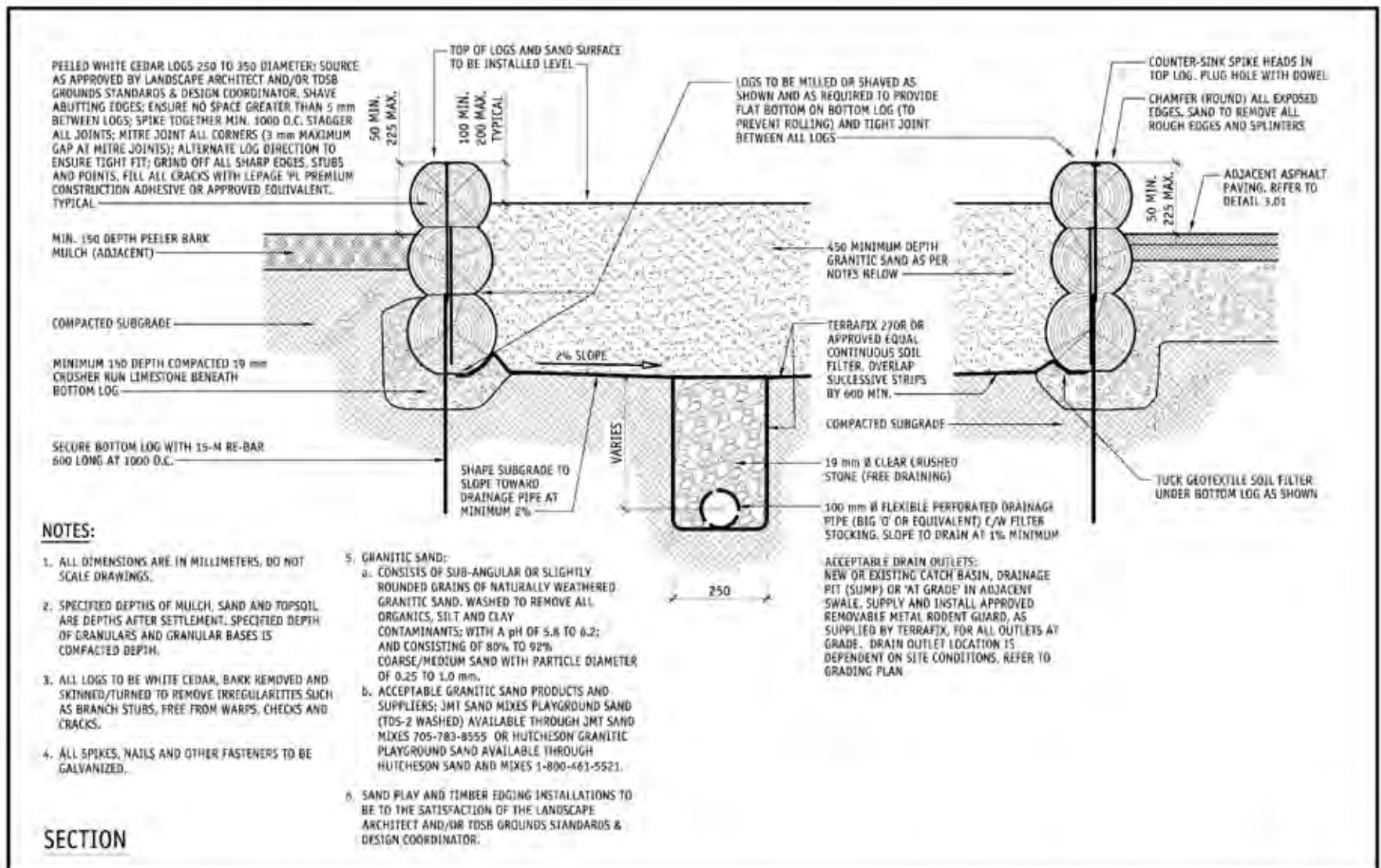
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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON: OALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>PALISADE POSTS WITH NOTCHES AND HANDHOLDS</b>				<b>5.15</b>



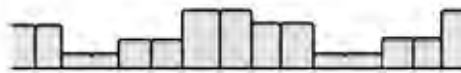
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			<b>SCHOOL GROUND STANDARD CONSTRUCTION DETAILS</b>	DATE: JANUARY 2013	NOT TO SCALE	DRAWN BY: KIM ALLERTON DALA	CHECKED BY: BRUCE DAY	DETAIL #
				<b>SEATING LOG KINDERGARTEN</b>				<b>5.21</b>



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				<b>SAND PLAY ROUGH TIMBER EDGING</b>				<b>6.01</b>



**ELEVATION**

ASPHALT FINISHED GRADE

CHAMFER TOP EDGES AS SHOWN

HEIGHT OF POSTS VARIES, STAGGER HEIGHTS RANDOMLY AND IN 'STEPS' OF MINIMUM 50 mm, ALWAYS MAINTAINING TWO POSTS SIDE-BY-SIDE AT SAME HEIGHT (AS PER ELEVATION AT LEFT). OBTAIN LANDSCAPE ARCHITECT'S AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR'S APPROVAL OF PROPOSED LAYOUT/HEIGHT CONFIGURATION PRIOR TO INSTALLATION. PROVIDE 600 mm WIDE SECTION WITH TOP OF POSTS 5 mm ABOVE GRADE OF ADJACENT SURFACING TO PROVIDE BARRIER-FREE ACCESS WHERE INDICATED ON LAYOUT PLAN

ROUND WOOD POSTS (PEELED WHITE CEDAR) 200<sub>h</sub> DIA. PLACED VERTICALLY AND TIGHTLY BUTTED TOGETHER AS SHOWN ON PLANS\*. ALTERNATE TAPERS 'ONE UP - ONE DOWN' TO ASSIST IN ACHIEVING TIGHT JOINTS. POSTS TO BE LIGHTLY SANDED WITH BELT SANDER PRIOR TO INSTALLATION. ENSURE ALL POSTS ARE FREE OF SPLINTERS, STABLE AND FREE OF MOVEMENT AFTER INSTALLATION.

SPIKE POSTS TOGETHER WITH 300 LONG GALVANIZED ARDOX/SPIRAL SPIKES INSTALLED ON AN ANGLE THROUGH EACH POST AND INTO THE ADJACENT POST

**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:
  - a. 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 3.0 mm.
  - b. ACCEPTABLE GRANITIC SAND PRODUCTS AND SUPPLIERS: JMT SAND MIXES PLAYGROUND SAND (TDS-2 WASHED) AVAILABLE THROUGH JMT SAND MIXES 705-783-8555 OR HUTCHESON GRANITIC PLAYGROUND SAND AVAILABLE THROUGH HUTCHESON SAND AND MIXES 1-800-461-5521.
6. SAND PLAY AND CEDAR POST EDGING INSTALLATIONS TO BE TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND/OR TDSB GROUNDS STANDARDS & DESIGN COORDINATOR.

ADJACENT ASPHALT PAVING. REFER TO DETAIL 3.01

VARIES 5 TO 225 MAX.

VARIES 105 TO 325 MAXIMUM

1200 MIN.

COMPACTED LIMESTONE SCREENINGS BACKFILL

SHAPE SUBGRADE TO SLOPE TOWARD DRAINAGE PIPE AT MINIMUM 2%

COMPACTED SUBGRADE

300 TO 400

450

100

450 MINIMUM DEPTH GRANITIC SAND AS PER NOTES BELOW. SURFACE OF SAND TO BE INSTALLED LEVEL

TERRAFIX 270R OR APPROVED EQUAL CONTINUOUS SOIL FILTER, OVERLAP SUCCESSIVE STRIPS BY 600 MIN.

19 mm Ø CLEAR CRUSHED STONE (FREE DRAINING)

100 mm Ø FLEXIBLE PERFORATED DRAINAGE PIPE (BIG 'O' OR EQUIVALENT) C/W FILTER STOCKING. SLOPE TO DRAIN AT 1% MINIMUM

ACCEPTABLE DRAIN OUTLETS: NEW OR EXISTING CATCH BASIN, DRAINAGE PIT (SUMP) OR 'AT GRADE' IN ADJACENT SWALE. SUPPLY AND INSTALL APPROVED REMOVABLE METAL RODENT GUARD, AS SUPPLIED BY TERRAFIX, FOR ALL OUTLETS AT GRADE. DRAIN OUTLET LOCATION IS DEPENDENT ON SITE CONDITIONS. REFER TO GRADING PLAN

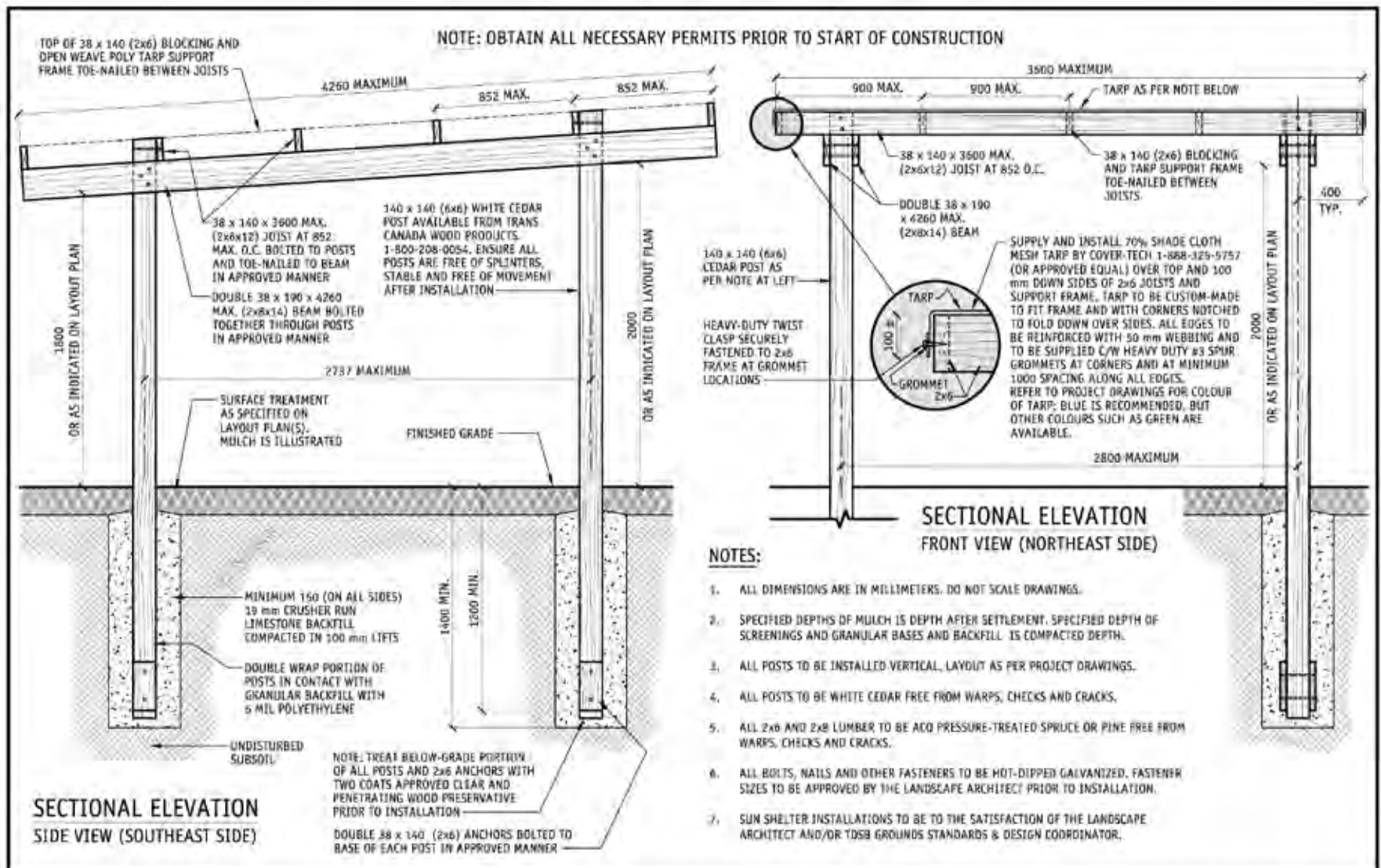
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VARIES

**SECTION**

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				<b>SAND PLAY CEDAR POST EDGING</b>				<b>6.02</b>



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# Watering Guidelines for Newly Planted Trees

## The Bucket Method

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.

### 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! (See sidebar.)
- 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 caretaker to save empty five-gallon containers from cleaning products. 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.

### ABOUT THE WATERING GUIDELINES

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.

### 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.

# Criteria for Acceptable Nursery Stock

## General

- (a) Trees shall be the size and variety noted on the Plant List. 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. Quality shall be in accordance with the latest "Guide Specification for Nursery Stock" of the Canadian Nursery Landscape Association.
- (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 Contract Administrator.
- (d) The Contract Administrator reserves the right to inspect the plant material at their original source, and to instruct the supplier on root and branch pruning requirements.
- (e) Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trades.
- (f) Plants larger than specified may be used if approved by the Contract Administrator. The use of such plants shall not increase the Contract price.
- (g) 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.
- (h) Where trees are measured by calliper (cal.), reference is made to the diameter of the trunk measured 300 mm above ground as the tree stands in the nursery.
- (i) 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.
- (j) 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
- (k) Protection of Stock
  - (i) 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.
  - (ii) 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

### 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 and construction industry does not use metric).

The formula for volume is:  $V = \text{Length} \times \text{Width} \times \text{Depth}$ .

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 ( $27 \text{ ft}^3 = 1 \text{ yd}^3$ ).

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 ( $1 \text{ m}^3 = 1.3 \text{ yd}^3$ ).

**TREES AND SHRUBS: RECOMMENDED DEPTH** (spread mulch 6" (15 cm) deep).

	Volume of mulch	Notes
Newly planted trees	½ cubic yard (about 13 milk crates)	Spread approximately 1 m out from the base
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 1 m 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)
<b>* For Garden beds, spread mulch to a depth of 4" or 10 cm.</b>		

### 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.

# Evergreen's Rationale for Avoiding ACQ Lumber

## SUMMARY

Alkaline copper quaternary (ACQ) is a chemical compound for pressure treating wood which has replaced chromated copper arsenate (CCA) in Canada. CCA wood is dangerous because it contains inorganic arsenic, among other toxins, which can be transferred to children's skin and mouths. Although ACQ treated lumber is a chromium- and arsenic-free alternative to CCA, concerns are still raised about the chemicals that will leach from it into surrounding soil, groundwater and air. Alternatives should be considered when building picnic tables, playground equipment fences, and school ground gardens.

## CONCERNS

When ACQ pressure treated lumber is freshly processed, emissions of ammonia will escape into the environment. Subjected to rain, unprotected wood will leach small amounts of chemicals into the soil. Its very high copper content acts as a fungicide. Studies have shown that ACQ leaches slightly greater quantities of chemical preservatives than CCA treated wood. Most notably it leaches roughly three times more copper than CCA lumber, counteracting the benefit of containing no chromium or arsenic. Although copper is not very toxic to mammals, it is to fungi (thus its fungicidal properties) and aquatic life. The damage to aquatic habitats is a notable concern.

Because of its chemical content, ACQ lumber should never be burnt, or chipped up and used for mulch. Proper disposal for

this wood is in a lined, non-hazardous material landfill. However, this is not an ideal solution. It will continue to contaminate nearby soil and water unless perfectly contained.

## ALTERNATIVES

Evergreen recommends using untreated heartwood, such as cedar for use in school ground equipment. Cedar and redwood are naturally rot-resistant, but will have to be replaced approximately every 20 years.

The heartwood of many local tree species contains rot-resistant compounds (e.g. chestnut and oak). Do not use sapwood, because this will only last a few years outdoors. Also, check out your local re-use centre for materials. Plastic lumber is also a good alternative. Be careful to choose an environmentally friendly type of plastic lumber.

For a list of lumber product ratings visit: [http://www.healthybuilding.net/pdf/gtpl/gtpl\\_product\\_ratings.pdf](http://www.healthybuilding.net/pdf/gtpl/gtpl_product_ratings.pdf).

## POLICY STATEMENT

Because limited information is available, Evergreen is taking a precautionary approach on this issue. We will not fund the use of ACQ lumber in school ground projects. When more is understood about the environmental impact of this chemical treating process, Evergreen may revise its position.

## APPENDIX E

# 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

The following list is a sample of design elements that you can incorporate into the design of your outdoor space.

- Sand pit with lift and/or ramp for universal access
- Puppet show wall
- Living wall
- Musical features; chimes, drums,
- Board walk; varying widths, raised
- Animal tracks throughout
- Labyrinth
- Outdoor classroom
- Shelters of varying sizes
- Murals; permanent and temporary (chalkboard walls)
- Sun dials
- Entrance arbours; willow, rounded, child-sized
- Mazes; temporary, permanent
- Stage
- Bridges
- Benches; logs, rocks, sculptures
- Outdoor easels – permanent or mobile
- Shade sails
- Tennis wall (one player)
- Water fountains; to drink from, to play with
- ‘Nests’
- Culturally relevant elements

# Recommended Plant List

## Deciduous Trees in Hard Surfaces (75mm caliper)

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

## Coniferous Trees in Hard Surfaces (250—300cm tall)

- White Spruce (*Picea glauca*)

## Deciduous Trees in Soft Surfaces (75mm caliper)

- Tulip Tree\* (*Liriodendron tulipifera*)
- Honey Locust (*Gleditsia triacanthos* var. *inermis*)
- Kentucky Coffee Tree (*Gymnocladus dioica*)
- Silver Maple\* (*Acer saccharinum*)
- Red Maple\* (*Acer rubrum*)
- Sugar Maple\* (*Acer saccharum*)
- Freeman Maple\* (*Acer freemani*)
- Yellowwood (*Cladrastis lutea*)
- Hackberry (*Celtis occidentalis*)
- Basswood (*Tilia americana*)
- Ironwood (*Ostrya virginiana*)
- Sweetgum (*Liquidambar styraciflua*)

**Deciduous Trees in Groves in Soft Surfaces** 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 (75mm caliper) (See 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 Dogwood (*Cornus alternifolia*)
- Redbud (*Cercis canadensis*)
- Gray Dogwood (*Cornus racemosa*)
- Ninebark (*Physocarpus opulifolius*)

\*Best Shade Trees – refers to sun-blocking ability of the tree





**EVERGREEN**  
*'magine your city with nature*