Regional Parks Design Guidelines December 2015

REGIONAL DISTRICT OF CENTRAL OKANAGAN

Final





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DECEMBER 2015

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1.0 INTRODUCTION

These guidelines are for planners, consultants, and contractors planning and constructing new and retrofit projects within Regional District of Central Okanagan (RDCO) regional parks. They are intended to provide the necessary tools and resources to plan, build and maintain park infrastructure that preserves the quality and integrity of regional park ecosystems. They are also intended to contribute to Regional Parks branding in a way that is consistent, coherent, and appropriate to the natural character of the parks, and to increase efficiency in both design and construction of park infrastructure.

1.1 REGIONAL DISTRICT OF CENTRAL OKANAGAN PARKS

The Regional District of Central Okanagan includes the four member municipalities of Kelowna, West Kelowna, Peachland, and Lake Country, the Westbank First Nation, two unincorporated electoral areas. Serving a population of approximately 180,000 (in 2011), Regional Parks currently maintains 1,900 hectares of parkland across the Regional District in 31 Regional Parks.

Overall Regional Parks planning and management are guided by The Regional Parks Plan Bylaw No. 884 (2000), the Regional Parks and Greenways Plan (2007), the Central Okanagan Regional Parks Legacy Program (2007), and individual park management plans, which outline high level acquisition, management, construction, and programmatic priorities. This document supports those plans, as well as ongoing maintenance

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activities, by providing the next level of detail on trail and infrastructure design, and by consolidating standard trail and infrastructure details and specifications.

1.2 HOW TO USE THIS DOCUMENT

This document contains resources to assist in new or retrofit park projects from the planning phase through to construction. It is divided into sections that can be used together or on a stand-alone basis, depending on the nature of the park planning or construction project.

	PHASE PARTICIPANTS		ACTIVITY	APPLICABLE DOCUMENT SECTION		
	Planning & Design	Park planners Consultants	 Review project planning checklist Review general design parameters Determine park management class Identify elements appropriate for park 	Sections 2-4 Appendix F: Project Planning Checklist		
OPTIONAL	RFQ or Tender	Park planners Consultants	Select construction details to include in RFQ or Tender documents Select construction specifications to include in RFQ or Tender documents	Appendix A: Park & Trail Construction Details Appendix B: Park & Trail Construction Specifications Appendix G: Paint Product & Colour Standards		
	Construction	Contractor Park staff	Use construction details & specifications to build project infrastructure	Appendix A: Park & Trail Construction Details Appendix B: Park & Trail Construction Specifications Appendix G: Paint Product & Colour Standards		
	Ongoing Maintenance & Sign/Wayfinding Design	Park staff	Ongoing maintenance activities Design park wayfinding & signage content	Appendix C: Visual Identity Standards Appendix D: Regional Parks Sign Guidelines Appendix E: Regional Parks Trail Rating Guidelines Appendix G: Paint Product & Colour Standards Appendix H: Maintenance Standards		

Section 2.0 Identity and Character and **Section 3.0 General Design Parameters** identify the broad goals and guidelines for the planning of all park infrastructure and trail projects, such as the materials and style that contribute to the RDCO Regional Parks 'brand,' and the general design parameters that apply to all regional park projects, such as accessibility, best management practices, and safety. These materials are generally intend-

ed for internal RDCO Parks planning purposes, or for use by consultants engaged in master or management planning.

Section 4.0 Parks and Trails Design Toolkit provides more specific information relating to the planning of individual park projects. Once a park management class has been determined, appropriate trail types, infrastructure, and furnishings can be identified for that park. All elements in the Toolkit reference details and specifications in the appendices. These materials are generally intended for internal RDCO Parks planning purposes, or for use by consultants engaged in master or management planning.

Appendix A Park and Trail Construction Details and Appendix B Park and Trail Construction Specifications contain standard construction details and specifications for most park trail and infrastructure. The materials in these appendices are intended for construction, whether in a Tender or Request for Qualifications process, construction packages, or for construction by parks staff.

Appendix C Visual Identity Standards contains standards for Regional Parks branding, notably use of the Regional Parks logo.

Appendix D Regional Parks Sign Guidelines contains standards for typefaces, colours, graphic elements, and content for interpretive signage and is intended primarily for internal staff involved in the production of park signage and interpretive elements.

Appendix E Regional Parks Trail Rating Guidelines contains the five trail rating classes as well as information on how to assign them to parks trails. Note that the trail difficulty ratings differ from trail construction standards; the difficulty rating will be found as a graphic element on park signage to assist a park user in determining whether a given trail is within his or her abilities.

Appendix F Project Planning Checklist contains a checklist created by Regional Parks staff to aid in the planning of park projects. This checklist is meant to assist planners in identifying relevant legal information, permitting, consultation, and documentation that may be required for a project.

Appendix G Paint Product & Colour Standards is a record of products and colours to be used for regional parks furnishings and infrastructure.

Appendix H Maintenance Standards outlines park and trail maintenance standards for use by Regional Parks operations personnel.

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2.0 IDENTITY AND CHARACTER

The use of standard materials, finishes, construction methods, and placement creates a coherent style, or identity, to enhance the profile of regional parks. The infrastructure, furnishings, and signage themselves are the vocabulary by which the values and purpose of Regional Parks are communicated to the community, and they contribute to a recognizable brand that conveys the recreation opportunities and natural character of these parks.

This section provides an overview of the types, styles, and materials for furnishings and structures that are appropriate for regional parks, and of the overall style that Regional Parks strives to convey. More specific guidelines on style, installation, and arrangement for each type of furnishing are provided in *Section 4.0 Parks and Trails Design Toolkit*.

2.1 CREATING A SENSE OF PLACE

'Sense of place' describes the overall perception held by visitors to or inhabitants of a place; it is often defined by the characteristics that make a place special, unique, or memorable. Overall, the Regional Parks sense of place is largely defined by both regional and site-specific ecological features, history, and educational and recreational opportunities. These parks have predominantly natural settings with minimal development or human intervention, facilitate passive recreation opportunities, and, to a lesser extent, represent the historical

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and contemporary activities of forestry and agriculture.

However, while these parks generally share a natural character, there are distinct differences in recreation opportunities and management priorities. Therefore, furnishings, structures, and signage should be appropriate to these management types without neglecting the overarching goal of complementing the parks' natural character and sense of place. The goal of all park infrastructure projects should be:

- to meet user needs with the minimum structures, furnishings, and construction required
- to use site-appropriate materials and colours
- to fit as seamlessly as possible into the surrounding landscape, and
- to facilitate sustainable management practices.

Sense of place can be further enhanced by concentrating infrastructure and signage at points of entry or activity. This serves both to create recognizable park entries, and to reduce the number of areas disturbed by construction or requiring maintenance.

2.2 MATERIALS AND TREATMENTS

To create a balance between the aesthetic, cultural, environmental, and economic values endorsed by Regional Parks, a palette of predominantly natural and renewable materials has been selected, complemented by metal elements. All materials are selected to be complimentary to each park, to contribute to creating a sense of place, and to be durable and easy to maintain.

The primary materials to be used for parks furnishings and signage are wood and metal. These two materials will help form the Regional Parks identity through their use in significant furnishings, structures, and signage







Timber kiosk with metal hardware and roof

and will be primarily located in areas of high visibility (e.g. park entries, parking lots, trailheads).

The overall style will reflect a robust and industrial look complementary of the region's forestry and agricultural history, and will have a durability and rusticity appropriate to the natural settings of regional parks.

Most wood applications to be unpainted, oversized rough cut lumber used in the construction of park entry signs, kiosks, fencing, and gateways. Wood will be:

- locally-sourced Douglas fir
- rough cut, no. 2 grade or better, with the largest members in square dimensions (e.g. 6"x6", 8"x8")
- unpainted

Hardware for wood structures and furnishings will be metal as follows:

- galvanized and painted or powdercoated black
- industrial appearance in application, including plates, bolts, saddles, and hangers
- preference for revealed connections and structural elements

The strongest presence of constructed elements and park branding will occur at park entries and trailheads; in general, the occurrence of constructed elements will decrease as one goes farther into a park. Some exceptions will occur, most notably destination points requiring infrastructure (e.g. waterfront piers).



Industrial-style metal hardware



Timber stairs



Rough cut timber and metal hardware application in park entry sign

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3.0 GENERAL DESIGN PARAMETERS

All constructed regional park infrastructure shall conform to a set of general design parameters. These parameters represent a minimum standard in good design and management relating to user enjoyment and safety, governmental regulations, and ecological values. They are intended to provide a framework within which the specific infrastructure guidelines, details, and specifications fit, and to fill any gaps not specifically addressed therein.

3.1 BIODIVERSITY AND CONSERVATION

An overarching goal of the Regional Parks program is to provide region-wide leadership in conservation and environmental stewardship, and to conserve a complete range of ecosystems and regionally-significant natural areas. All park trails and infrastructure should be designed and constructed with the values of biodiversity enhancement and conservation in mind. Wherever possible, the inclusion of trails and infrastructure should not reduce the quality or integrity of habitat; rather, where possible, opportunities to enhance habitat and biodiversity should be sought.

3.2 ACCESSIBILITY AND UNIVERSAL DESIGN

RDCO Regional Parks is committed to providing opportunities to users of all abilities to experience and enjoy regional parks, trails, and facilities. Universal design considers and incorporates the needs of as many people

as possible, and accessible design enables a person with a disability to make use of an area or facility without assistance. While the goal is not to have each and every trail and park feature be fully accessible to all park users, all new and retrofit projects within regional parks should acknowledge accessibility and universal design as primary considerations in their design and implementation. For example, the cost and infrastructure required to make a trail in steep and difficult terrain accessible to those with mobility challenges may not be feasible. However, this trail may have crib stairs and handrails added to increase ease of use, or another trail in the same park might be designed with more rolling terrain in order to provide a greater range of options for those with mobility challenges.

3.3 BEST MANAGEMENT PRACTICES

Best management practices (BMPs) are techniques or measures widely accepted to be the most effective and practical means of achieving an objective. Often used in the management of natural resources, BMPs are not typically legally binding but offer guidelines for environmental stewardship, often in relation to waterways, soil resources, or wildlife habitat. Where applicable to regional parks planning and design exercises, refer to existing and current best management practices by provincial and regional agencies. Examples include, but are not limited to:

BC Water Act, Section 9 and the BC Water Act Regulation, Part 7

Best Management Practices for Recreational Activities on Grasslands in the Thompson and Okanagan Basins. 2004. Ministry of Water, Land and Air Protection.

Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Ministry of Environment.

Standards and Best Practices for Instream Works. 2004. Ministry of Water, Land and Air Protection.

3.4 PERMITTING AND APPROVALS

Permits, approvals, and notifications may be required prior to undertaking construction or maintenance activities within regional parks. Ensure that the required permits and approvals have been obtained for all projects, and that proposed activities within the park conform with the terms of any lease or license agreements, grant conditions, maintenance contracts, covenants, or memoranda of understanding. Appendix D: Project Planning Checklist includes a more complete list of the approvals, permitting, notifications, consultations, and critical data that may be required during the planning phase of projects within regional parks.

3.5 HAZARDS

Potential hazards during both construction and ongoing park use should be considered in the planning phase of each project. Existing or new hazard or risk assessments that may be considered include, but are not limited to, geotechnical, hazard tree, wildfire, and structural.

3.6 SAFETY & CPTED

Crime prevention through environmental design (CPTED) is an approach for reducing crime and the fear of crime through planning and design of private and public spaces. CPTED principles and strategies predominantly feature natural surveillance, decreasing opportunities for crime, and creating a sense of care and ownership. While much of the CPTED literature focusses on urban areas and the built environment, there are many CPTED principles that can be applied to the rural settings in which regional parks often occur. For example:

- Remove obstructions from sightlines by pruning lowest limbs of trees to a height of 1.8m
- Ensure structures and furnishings (e.g. fences) are visually permeable
- Use appropriate lighting. For example, over-bright security lighting around buildings and parking lots can create glare and deep shadows
- Ensure ease of maintenance so that the area is perceived as being monitored and safe
- Create well-defined and clear park entries

CPTED principles should be prioritized in the design of park infrastructure, especially buildings and parking areas. These principles are less applicable away from these built and more urban 'nodes,' such as along trails or in wilderness areas, especially considering that regional parks are closed during nighttime hours.

4.0 PARKS AND TRAILS DESIGN TOOLKIT

The toolkit consists of trail types, furnishings, and signage that have been pre-approved or pre-designed for use in regional parks. The toolkit is referred to when adding or upgrading furnishings and signage in parks; generally, all park elements will be selected from the toolkit, although there are special cases where unique items can be considered by the Director of Parks or designate.

4.1 PARK MANAGEMENT CLASSES

Regional parks are divided into four classes, which guide management decisions, access, and design elements. These classes provide a useful first step in determining which trail types, furnishings, and signage will be appropriate for a particular park. For example, a Conservation class park, which has limited or controlled public access in order to protect habitat values, will likely not be an appropriate park for extensive Major Multi-Use or Standard Multi-Use trails, but may have important interpretive opportunities that would allow the judicial use of standard interpretive sign structures. The four park management classes are Conservation, Natural, Recreation/Cultural/Waterfront, and Trails/Greenways.

4.1.1 Conservation

Regional Conservation Parks are managed for the protection or enhancement of habitat values or vegetation and wildlife. The provision of recreation may occur but is subordinate to habitat values.

Natural processes may take their natural course and management practices may occur at the detriment of aesthetics or public access.

4.1.2 Natural

Regional Natural Area Parks provide opportunities for increasing awareness and knowledge of the natural environment of the Okanagan Valley. These areas must contain regionally significant features of geology, physiography, vegetation communities, or wildlife habitat.

4.1.3 Recreation/Cultural/Waterfront

Regional Recreation/Cultural/Waterfront Parks provide varied formats for more active recreation. These parks primarily focus on meeting the aquatic recreation needs of the region and/or preserve unique cultural landscapes. The management emphasis within Regional Recreation/Cultural/Waterfront Parks will be intensive outdoor or interpretive program day use.

4.1.4 Trails/Greenways

Regional Trails will be established to link provincial, regional, and major municipal parks throughout the Central Okanagan. Development of the Regional Trail System will require collaboration in the acquisition and development of greenway systems that provide both recreational and habitat links to other open spaces.

4.2 TRAIL CLASSIFICATIONS

Five types of trails occur in Regional Parks, accommodating a range of users and recreational opportunities, and responding to a range of terrain and park types. When selecting a trail class for new trail construction or existing trail enhancement, trail slope, substrate, construction access, user types, user volume, and environmental impact should all be considered.

These five classes have been created to accommodate the widest range of uses, from fully accessible multi-use corridors to informal backcountry hiking trails, from wide multi-use commuter routes to short loops within parks. Generally, the trail classes are ordered from high (Type 1: Major Multi-Use) to low (Type 5: Wilderness) user intensity, number of users, construction standard, maintenance standard, and environmental impact.

Note that construction details are provided only for Trail Types 1, 2, 3, and 4, which feature machine or hand construction. Trail Type 5 is minimally improved or unconstructed, usually occurring organically from historical use, animal trails, or unsanctioned use.

CLASSIFICATION	SURFACE	CONSTRUCTION	TREAD WIDTH	CLEARED TRAIL WIDTH	MAX. SLOPE	ACCESSIBILITY	VERTICAL CLEARANCE
Type 1: Major Multi-Use	Compacted granular / asphalt	Machine	3 - 4.5m	5 - 6.5m	8%	Accessible / barrier free	3m
Type 2: Standard Multi-Use	Compacted granular	Machine	1.5 - 3m	3.5 - 5m	15%	Limited due to slope	3m
Type 3: Narrow Multi-Use	Compacted granular / native material	Machine / hand	1 - 1.5m	2 - 2.5m	25%	Limited due to slope & surface	2.5m
Type 4: Nature	Native material	Hand / unconstructed	0.5 - 1.0m	1 - 2m	n/a	Very limited due to slope & surface	2.5m
Type 5: Wilderness	Native material	Unconstructed	max. 0.5m	n/a	n/a	Very limited due to slope & surface	n/a

Regional Parks Trail Classifications

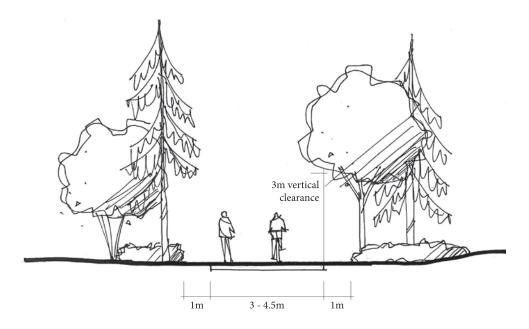
When selecting a trail classification, additional consideration should be given to trail drainage and receiving slopes susceptible to erosion. Trails situated on slopes will usually be outsloped to drain with natural sheet flow off the trail and into the landscape on the downslope side. In flat areas, trails should still be outsloped to drain, but a swale will be required for conditions that do not allow the water to continue draining away from the trail.

However, certain site conditions may require alternative solutions; soil type, natural drainage patterns depositing excess water onto the trail, or trail width may contribute to drainage problems such as erosion or pooling that cannot be solved with cross-slopes alone.

Water bars, once a common method of providing trail drainage, have been replaced by many trail builders with rolling dips. Water bars, which require the use of earth, rock, or logs to direct water off the trail, are less stable, create an obstacle on the trail, and are prone to clogging with silt when used on slopes greater than

5%. Rolling dips are constructed with the same compacted material as the rest of the trail and have a gentle slope that does not impede trail traffic; in addition, they require virtually no maintenance. However, on slopes steeper than 15%, they are less effective at preventing erosion and are required to be spaced so close together that an alternative solution, such as trail realignment or the use of crib stairs, is a more sustainable solution that will require less maintenance and provide a more stable trail in the long term.

4.2.1 Type 1: Major Multi-Use



The Major Multi-Use trail is a corridor serving as both a transportation and recreation route. Typically, a Major Multi-Use trail will connect to other regional or municipal trails, or to major destinations and recreation opportunities within the community.

The Major Multi-Use trail will be between 3 and 4.5m wide with compacted granular surfacing and minimal slopes to maintain accessibility. Users will include walkers/hikers, commuter and recreational cyclists, and equestrian traffic. It will accommodate moderate to high levels of use, and should be barrier-free. Structures may include short- and long-span pedestrian bridges.

Example: Mission Creek Greenway Phase 1

CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 15 51.01 Trail Type 1: Major Multi-Use Appendix B: Specification 32 15 00-S Off-Road Trails

Related Details:

Detail 32 15 51.05 Trail Sideslope

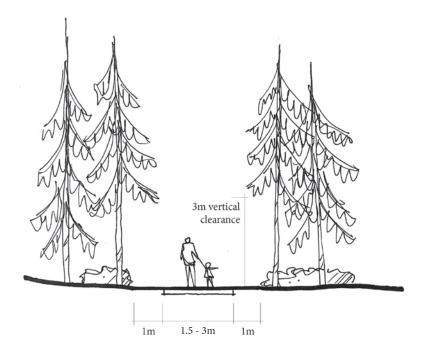
Detail 32 31 10.01 Guardrail

Detail 32 31 10.15 Greenway Gate

Detail 32 34 10.01-.02 Scalable Free Span Bridge

Detail 32 34 10.06-.07 Wetland Boardwalk

4.2.2 Type 2: Standard Multi-use



The primary function of the Standard Multi-Use trail is for recreation, although in some cases they may be used for pedestrian transportation purposes. These trails may serve as primary routes into parks of all types, or provide circulation in Recreation/Cultural/Waterfront parks. Standard Multi-Use trails typically will not be found in backcountry areas or Conservation classification parks, where wide and level trails are less required or less appropriate to existing site conditions.

While generally accessible, Standard Multi-Use trails may have limited accessibility in sections due to steeper slopes. They will be between 1.5 and 3m wide with compacted granular surfacing, and will be level with intermittent slopes to a maximum of 15%. Users will include walkers/hikers, cross-country mountain bikers, and equestrian traffic. Levels of use will be moderate, and structures may include short- and long-span pedestrian bridges, and boardwalks.

Example: Bertram Creek Regional Park

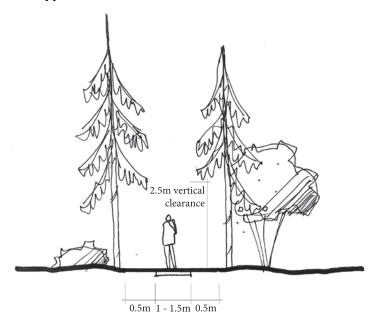
CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 15 51.02 Trail Type 2: Standard Multi-Use Appendix B: Specification 32 15 00-S Off-Road Trails

Related Details:

Detail 32 15 51.05 Trail Sideslope Detail 32 15 51.06 Trail In Bedrock Detail 32 31 10.01 Guardrail Detail 32 34 10.01-.02 Scalable Free Span Bridge Detail 32 34 10.06-.07 Wetland Boardwalk

4.2.3 Type 3: Narrow Multi-Use



Narrow Multi-Use trails are recreational trails throughout Conservation, Natural, and Recreation/Cultural/Waterfront park types. They accommodate low to moderate levels of use and are common to both backcountry and front country conditions. They may be planned routes, or may have evolved through park use. Their primary function is to facilitate circulation and recreation throughout regional parks, and to provide access to major park features. Users will include walkers/hikers, cross-country mountain bikers and equestrian traffic where identified as appropriate.

Narrow Multi-Use trails vary depending on site conditions. They are 1 to 1.5m wide and may have a combination of machine-built compacted granular surfacing or hand-built native material surfacing as appropriate to site conditions and park use. Due to varying slopes and construction materials, these trails have limited accessibility. Structures associated with these trails may include short- and long-span pedestrian bridges, boardwalks, retaining walls, and timber or crib stairs.

Example: Kalamoir Regional Park

CONSTRUCTION DETAILS AND SPECIFICATIONS

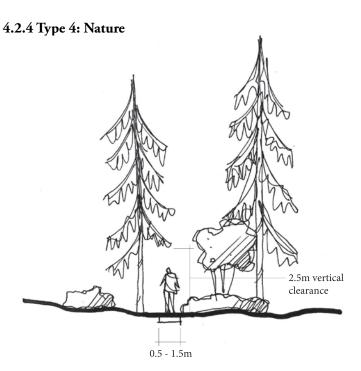
Appendix A: Detail 32 15 51.03 Trail Type 3: Narrow Multi-Use Appendix B: Specification 32 15 00-S Off-Road Trails

Related Details:

Detail 32 15 51.05 Trail Sideslope Detail 32 15 51.15 Bedrock Stairs
Detail 32 15 51.06 Trail In Bedrock Detail 32 31 10.01 Guardrail

Detail 32 15 51.12 Crib Stairs Detail 32 34 10.01-.02 Scalable Free Span Bridge

Detail 32 15 51.14 Boulder Stairs Detail 32 34 10.10 Trail Boardwalk



Nature trails are recreational trails that are a combination of planned and unplanned trails that have evolved through park use; they may be a combination of newly constructed or improved trails on existing or new routes. They occur predominantly in backcountry areas of Conservation and Natural park types and accommodate low to moderate levels of use. Their primary function is to provide hiking routes throughout Regional parks. Users include hikers and, where identified as appropriate, equestrian traffic and cross-country mountain bikers.

Rustic/Nature trails are 0.5 to 1.5m wide and are hand-built on native materials. Due to varying slopes and site conditions, these trails have very limited accessibility. No special accommodations will be made for specific user groups, such as mountain bikers, strollers, etc. Where slopes exceed 25%, timber or crib stairs may be included; other structures include short- and long-span pedestrian bridges and boardwalks where required.

Example: Glen Canyon Regional Park

CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 15 51.04 Trail Type 4: Nature Appendix B: Specification 32 15 00-S Off-Road Trails

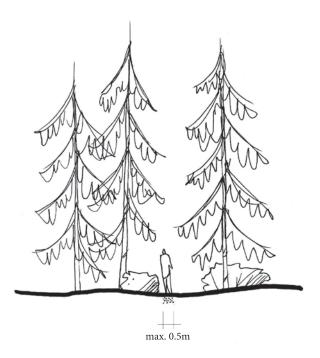
Related Details:

Detail 32 15 51.05 Trail Sideslope Detail 32 15 51.17 Bedrock Stairs
Detail 32 15 51.06 Trail In Bedrock Detail 32 31 10.01 Guardrail

Detail 32 15 51.12 Crib Stairs Detail 32 34 10.01-.02 Scalable Free Span Bridge

Detail 32 15 51.16 Boulder Stairs Detail 32 34 10.10 Trail Boardwalk

4.2.5 Type 5: Wilderness



Wilderness trails are recreational trails that are typically unplanned and have evolved through natural wear patterns; except under special circumstances, they have not been constructed or improved. They occur predominantly in backcountry areas of Conservation and Natural park types and accommodate low to moderate levels of use. Their primary function is to provide hiking routes throughout Regional parks. Users include hikers and, where identified as appropriate, cross-country mountain bikers.

Wilderness trails are a maximum 0.5m wide on native materials, and will not be maintained regularly by Regional Parks staff. They do not have slope, width, or vertical clearance standards because of their nature as unplanned and unmaintained trails. Due to varying slopes and site conditions, these trails have very limited accessibility.

Example: Johns Family Nature Conservancy Regional Park

CONSTRUCTION DETAILS AND SPECIFICATIONS

There are no applicable Trail Construction Details or Specifications for Wilderness trails, which are typically not constructed.

4.3 INFRASTRUCTURE DESIGN GUIDELINES

4.3.1 Standard Infrastructure

GATES

Gates are used to block vehicle entry into parks from public roadways, or to block vehicle access to trails within parks. They may be either 6m vehicle gates, swing-arm greenway gates, user baffles, or maintenance gates.



Vehicle gate at parking lot

LOCATION: Vehicle gates are located at park entrances off municipal roadways. Swingarm greenway gates are located at public right-of-way and major Multi-Use corridor intersections. User baffles may be located along trails where pedestrian access is encouraged while preventing bicycle or vehicle access.

Style and Materials: Vehicle gates are prefabricated steel, painted black. Swing-arm greenway gates are yellow-painted steel. Maintenance gates and user baffles typically will match adjacent fencing in material and colour.



Swing-arm greenway gate on Mission Creek Greenway

PLACEMENT: Gates will preferably swing inwards onto park property; if the gate must swing outwards, all parts of the gate must be within park property when open.

GATE CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail Section 32 31 10 Fences & Gates Appendix B: Specification 32 31 00-S Fences & Gates

FENCES

Permanent fences are used for property delineation, securing parks infrastructure, defining playing fields, and for park identity and branding. The types of fences that may be placed in regional parks include split rail fences, field fencing, and 3-rail fencing.



Split rail fence at Gellatly Nut Farm Regional Park

LOCATION: Split rail fences are used for heritage applications (e.g. Gellatly Nut Farm Regional Park) where they delineate park entries visible from vehicle rights-of-way. To delineate private and park property (e.g. Glen Canyon Regional Park), field fencing is the preferred treatment. A 3-rail fence may be used in place of field fencing where wildlife access is desirable (e.g. Trepanier Creek Greenway Regional Park).

STYLE AND MATERIALS: The following fencing styles are acceptable in regional park settings:

- Split rail fencing: 1.2m high 2-rail fence constructed of rough cut Douglas fir wood 6"x6" posts and rails (e.g. heritage fencing at Gellatly Nut Farm Regional Park)
- Field fencing: 1.8m high page wire galvanized mesh with 4"x6" openings, on 5" round pressure-treated wood posts
- 3-rail fence: 1.2m height fence with cedar rails on 5" round pressure-treated wood posts. Space posts 3m (10') and allow 0.3m (1') rail overlap

PLACEMENT: Fences and their footings will be installed entirely within park property. Split rail fencing used at park entries is to be installed a minimum of 4m back from the property line at the public right-of-way.

FENCE CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 31 10 Fences & Gates Appendix B: Specification 32 31 00-S Fences & Gates

Split Rail Fence Detail 32 31 10.03

Field Fence Detail 32 31 10.04

3-Rail Fence Detail 32 31 10.05

GUARDRAILS

Freestanding guardrails provide a physical barrier at a steep slope or other hazardous feature that poses a potential risk to park users. In some cases, guardrails may also be used to delineate parking areas or park entries.







Guardrail delineating parking area

Location: Locate guardrails anywhere in parks where users may attempt to approach a steep slope, unstable edge, or potentially unsafe feature. Note that these areas may especially occur at desirable views or features, whether the area is accessible by a sanctioned trail or not. Guardrails may also be used to block access to decommissioned trails or sensitive habitat, or to delineate parking lots inside the park property (e.g. to act as a vehicle barrier between the park trails and the parking area).

STYLE AND MATERIALS: Guardrails must be 1.06m (42") height and are to be constructed of rough sawn Douglas fir posts and rails.

PLACEMENT: Set guardrails back from hazards or steep slopes a minimum of 1m, or as required by geotechnical assessment.

GUARDRAIL CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 31 10.01 Guardrail Appendix B: Specification 32 31 00-S Fences & Gates

HANDRAILS

Freestanding handrails provide a barrier and grippable surface for users in difficult terrain.

LOCATION: Handrails may be located anywhere on regional park trails where required for user safety or stability.



Timber handrail

STYLE AND MATERIALS: Handrails must be 1.06m (42") height. The posts are to be rough sawn Douglas fir; the rails and handrail are to be constructed of dimensional Douglas fir. Where a curved handrail is required, the handrail may be black powdercoated aluminum. If a freestanding handrail is adjacent to an elevation change 0.6m or greater, add a base rail.

PLACEMENT: Place handrails immediately adjacent to trails in steeply sloping areas, or on trails with steep side slopes where the handrail can double as a guardrail. Where the adjacent slope exceeds 30% or there is a drop of 10cm or greater, a toe kick should be added at the base of the handrail.

HANDRAIL CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 31 10.06 Timber Handrail
Detail 32 31 10.07 Metal Handrail
Appendix B: Specification 32 31 00-S Fences & Gates

RETAINING WALLS Retaining walls may be required for trail work in areas of steep or eroding slopes. To reduce ecological and visual impact, retaining walls should be used as little as possible. For most trail planning projects, if a retaining wall of height greater than 1.2m or length greater than 20m is required, an alternative trail route may be desirable and should be considered.

LOCATION: Retaining walls are installed at points of identified erosion or potential slope failure within regional parks, typically along trails.

STYLE AND MATERIALS: Timber, gabion, and dry stack retaining walls are acceptable forms of construction. Dry stack walls may be desirable in areas that are difficult to access for construction and/or have site-available rock, provided the use of the rock does not negatively impact habitat or hydrology.

PLACEMENT: Retaining walls may be placed on either the uphill or downhill sides of a trail as required.

RETAINING WALL CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 32 00 Retaining Walls Appendix B: Specification 32 32 00-S Retaining Walls

BOLLARDS

Bollards are used to delineate edges and prevent vehicle access.

LOCATION: Bollards may be used around parking lots or in areas where it is desirable to block vehicle access but fencing is not appropriate.



Boulders as bollards between park parking lot and public roadway

STYLE AND MATERIALS: Bollards are typically 0.9m (3') high non-removable fir posts at 1.8m (6') spacing on centre. Boulders of minimum 0.75m (30") height and 0.9m (1') width, with maximum 1.8m (6') clear distance between, may also be used if available on-site or easily transported to site.

PLACEMENT: Bollards may be placed along parking areas at public rights-of way, and along parking lot sides to prevent vehicle access into the park. Obtain municipal or provincial approval if the bollards are to be placed within the right-of-way.

BOLLARD CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 31 10.02 Timber Bollard Appendix B: Specification 32 31 00-S Fences & Gates

GARBAGE & RECYCLING RECEPTACLES

Garbage and recycling receptacles are available in all regional parks. The standard installation is a double receptacle with both garbage and recycling bins.

LOCATION: All regional parks will have a minimum of one double garbage and recycling unit, to be placed at park entries, typically in parking areas to enhance visibility for park users and to facilitate maintenance by park staff. Do not locate directly adjacent to rights-of-way, as disposal of household garbage may become an issue. Additional garbage and recycling receptacles may be required in parks with higher visitor numbers or where additional activities occur (e.g. beaches, picnic areas, playgrounds).



Bear-resistant Garbage and Recycling Receptacle

STYLE AND MATERIALS: A standard double bear-resistant garbage and recycling receptacle, installed on a concrete pad, is used in all regional parks.

PLACEMENT: Place garbage and recycling receptacles near trailheads or park entries where visitors are most likely to pass them when entering or exiting the park. Placing

receptacles near kiosks or regulatory signage at park entries can further enhance use by creating an amenity node. When placing receptacles near beaches, picnic areas, or other facilities, ensure they are visible and easily accessible, but are not placed so close to activities that odour is an issue.

GARBAGE & RECYCLING DETAILS AND SPECIFICATIONS

Hid-A-Bag II Combo Waste & Recycle Container, Double Compartment, 470L by Haul-All 1-888-428-5255 or pre-approved equal c/w keyed unload door and recycle logo decal Colour: black and blue powdercoated

BENCHES & TABLES

Two types of benches are used in Regional Parks: a standard manufactured park bench and picnic table for more urban and easily-accessible areas, and a site-constructed bench for more remote parks and trails.

LOCATION: For ease of installation, and because of its urban style, the manufactured bench should be installed on a cast-in-place concrete pad within a reasonable distance from a parking lot or maintenance-vehicle accessible road or trail. Manufactured benches and tables may be used along Major Multi-Use trails and in Recreation/Cultural/Waterfront Parks.

Site-constructed benches may be installed in Conservation and Natural Parks, and along Standard Multi-Use, Narrow Multi-Use, and Nature trails anywhere that a resting or viewing opportunity is identified. They will not be used on Major Multi-Use trails or in Recreation/Cultural/Waterfront Parks.







Standard manufactured table

STYLE AND MATERIALS: The manufactured bench and table have powdercoated aluminum frames with recycled plastic slats. The site-constructed bench will have bases constructed from boulders or wood that may be sensitively salvaged on-site or imported.

The tops for the site-constructed benches will be a metal anchor frame topped with dimensional wood slats.

PLACEMENT: Where possible, place benches to face onto trails. Avoid placing benches with backs to trails, as this can be an uncomfortable placement for users. Consideration to views and trail length/difficulty should be given when determining bench placement.

BENCH & TABLE CONSTRUCTION DETAILS AND SPECIFICATIONS

Manufactured Bench: Rutherford Park Bench with Angled Leg, Model RAL-06 by Wishbone Site Furnishings (604) 626-0476 or approved equal Colour: black powdercoated frame and sand slats

Manufactured Table: Rutherford Picnic Table, Model RPT-6 by Wishbone Site Furnishings (604) 626-0476 or approved equal Colour: black powdercoated frame and sand slats

Appendix A: Detail 32 36 13.01 Site-constructed Bench Appendix B: Specification 32 36 00-S Structures

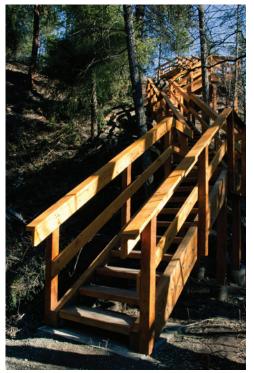
STAIRS Timber, crib, boulder, or bedrock stairs may be required on steep sections of trails.

LOCATION: Stairs may be located anywhere along Type 3: Narrow Multi-Use and Type 4: Nature trails where slopes are greater than 25%. If slopes exceed 50%, or if the substrate does not allow the construction of crib or boulder stairs, timber stairs may be used.

PLACEMENT: Stairs should be placed in alignments that minimize site disturbance and total number of stairs required. For longer flights of stairs, regardless of type, allow for frequent landings where possible (10 risers between landings is preferred).

STYLE AND MATERIALS: For short runs or for slopes between 25 and 50%, crib, boulder, or bedrock stairs are the preferred options. Crib stairs are constructed of timber and native material or crusher chip, and are built where site conditions allow. If stone slabs or boulders are available on-site in appropriate shapes and sizes, they may be used to construct boulder stairs. In areas where no mineral soil or loose rock exists, bedrock stairs may be constructed by breaking and shaping the exposed bedrock; however, this option is not preferred and should be used only where trail rerouting and other stair construction methods are not possible.

Timber stairs are constructed of rough-cut timber and typically will require engineering.





Timber stairs Crib steps

STAIR DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 15 51.12 Crib Stairs

Detail 32 15 51.16 Boulder Stairs Detail 32 15 51.17 Bedrock Stairs

Detail Section 32 33 10-S Fabricated Stairs Specification 32 15 00-S Off-Road Trails

Appendix B: Specification 32 15 00-S Off-Road Trails

Specification 32 33 00-S Fabricated Stairs

Related Details:

Detail 32 15 51.13 Bike Ramp

Detail 32 15 51.14 Metal Handrail Crib Stair Connection Detail 32 15 51.15 Timber Handrail Crib Stair Connection

SCALABLE FREE Free-span bridges allow pedestrian and (occasionally) maintenance vehicle access over permanent or seasonal waterways, gullies, or otherwise uncrossable landforms in regional parks.



Pedestrian bridge at Hardy Falls Regional Park

LOCATION: Free span bridges may be located along Type 1 to Type 4 trails, provided site access allows for their installation.

STYLE AND MATERIALS: The pedestrian bridge used in regional parks will be constructed of rough-cut and dimensional lumber on either steel or timber beams depending on length of span.

PLACEMENT: Bridges should be designed and constructed to minimize site disturbance. Ensure required approvals, permitting, and notifications relating to work around waterways are adhered to.

SCALABLE FREE SPAN BRIDGE DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 34 10.01-02 Scalable Free Span Bridge Appendix B: Specification 32 34 00-S Fabricated Bridges-Boardwalks

TRAIL BOARDWALK

Trail boardwalks are intended for areas along trails that experience seasonal flooding or persistent drainage problems.

LOCATION: Trail boardwalks may be located along Type 2 to Type 4 trails as required.

STYLE AND MATERIALS: Trail boardwalks are constructed of 2"x6" decking over concrete pedestals.



Trail boardwalk

PLACEMENT: Boardwalks are often installed in ecologically sensitive areas or areas with construction limitations. In such instances, it may not be possible to place boardwalks in a direct or straight path. Where required, boardwalk sections may be angled or curved depending on site conditions.

TRAIL BOARDWALK DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 34 10.10 Trail Boardwalk Appendix B: Specification 32 34 00-S Fabricated Bridges-Boardwalks

COMFORT STATION

Comfort stations are outhouses located in some regional parks.

LOCATION: Comfort stations are located in parks with significant visitorship and recreation opportunities.

Style and Materials: Comfort stations are $1.8 \text{m} \times 1.7 \text{m}$ timber structures with metal roof and concrete in-ground tank.

PLACEMENT: Comfort stations should be placed in proximity to major park entrances, parking lots, or major activity nodes. Their placement must facilitate maintenance access for cleaning and pumping. Two structures (i.e. female and male) are typical and preferred, but a single unisex structure may be used if space is restricted.



Comfort station in Kalamoir Regional Park



New model comfort station in Johns Family Nature Conservancy Regional Park

COMFORT STATION CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 10.01-02 Comfort Station Appendix B: Specification 32 36 00-S Structures

DESTINATION SIGN

Destination signs provide general direction to regional parks from primary and arterial vehicular routes in the park's vicinity. These signs must meet Provincial Ministry of Transportation and Highways standards for design and placement.

LOCATION: Destination signs are located off park property on municipal or provincial roadways.

STYLE AND MATERIALS: Per Ministry of Transportation and Highways standards.

PLACEMENT: Each destination sign is individually placed based on Provincial Sign Guidelines. Refer to the document *Manual of Standard Traffic Signs and Pavement Markings*, specifically section 1.7 Standardization of Placement, published by the BC Ministry of Transportation and Highways.

DESTINATION SIGN CONSTRUCTION DETAILS AND SPECIFICATIONS

Refer to the documents Specifications for Standard Highway Sign Materials, Fabrication and Supply and Policy Manual for Supplemental Signs, Appendix 2: Sign Specifications published by the BC Ministry of Transportation and Highways.

PARK ENTRY SIGN

Park entry signs are prominent timber structures marking each regional park at its primary access point along a road right-of-way. The structure supports a standardized sign with the name of the park and the Regional Parks logo, serving as both a locational device and a tool for promoting the identity and profile of regional parks.

LOCATION: Park entry signs are located at park entrances off municipal roadways. If there is more than one major park entrance off a roadway, a park entry sign may be installed at each entrance at the discretion of a special planning committee.

STYLE AND MATERIALS: The park entry sign structure is constructed of two 8x8" timber posts supporting a timber sign with the distinctive Regional Parks arced top. Laminated cedar, if available, is preferred. The structure features black powdercoated brackets, hardware, and post caps.

PLACEMENT: Park entry signs should be placed in a prominent location close to the park entrance and within a driver's field of vision so that a driver travelling at a reasonable rate of speed has sufficient time to comprehend and respond to the sign. These signs are not intended for double-sided use, so they should be placed parallel, not perpendicular, to the public roadway unless special circumstances dictate. The park entry sign and structure will not block sight lines for traffic entering or exiting the park or adjacent roadway, and should fall entirely within the park property. Park entry signs

and structures will not block or interfere with other regulatory or municipal signage or structures.



Park entry sign

Vegetation (e.g. overhanging tree branches) should be cleared or pruned around the sign structure and sign to maintain visibility, and consideration to municipal snow removal should be given to ensure snow does not accumulate around the base of the structure.

Signs will generally be installed so that the bottom of the sign is 1.5m (5') above the nearest travelled roadway edge. In some situations (e.g. the sign structure is installed on a slope several feet lower than the roadway edge), this will result in a disproportionately tall sign structure. To mitigate this effect, consideration should be given to planting native plant materials of maximum 1.2m (4') mature height beneath the sign, or to placing site-available boulders beneath the sign.

PARK ENTRY SIGN DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.01 Sign Structure: Park Entry Sign Appendix B: Specification 32 36 00-S Structures

For park entry sign content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

KIOSK

Two-sided metal-roofed kiosks are constructed of rough-cut timber and black powder-coated metal hardware, and house aluminum panels of wayfinding and general park information. Four- and twelve-sided kiosks will continue to be maintained, but will no longer be installed as new projects.

LOCATION: Two-sided kiosks are located at trailheads that start from major parking areas although, depending on the situation, may also be located at park boundary trail access points that experience heavy visitor traffic. If more than two panels are required to communicate all park information, two kiosks may be used. If it is determined that more than two kiosks are needed at a single location, a special planning committee may approve a more appropriate structure.

Note that kiosks are not to be located within parks for reasons of installation and maintenance; rather, they should be restricted to the locations described above. A kiosk may be located within a park under special circumstances only, to be assessed by a parks planning committee.



Kiosk at trailhead

STYLE AND MATERIALS: Kiosks are constructed of (2) 6"x6" rough-cut timber supports for 48 x 36" landscape-oriented sign panels. The kiosk is topped with a green metal roof.

PLACEMENT: Kiosks should be placed close to the trailhead at an inviting angle that draws the visitor toward the trail, rather than at a perpendicular placement. The underside of the roof of the kiosk should be 2.0m above finish grade. Allow for enough space surrounding the kiosk to allow two or three adults to manoeuvre freely and not feel restricted or confined; the area around the kiosk should be free of vegetation and obstacles so that there are clear sightlines and no tripping hazards.

If two kiosks are used at one location, their placement will be relational; the two kiosks could straddle the trailhead, or be paired on one side of the trail. Avoid placing the kiosks at random angles, too closely, or too far apart.

Other factors to consider when placing kiosks include available space, slope, safety and hazards, sun angle and glare, seasonal affects (shade, flooding), and minimizing impact on the surrounding environment.

KIOSK DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.02 Sign Structure: Kiosk Appendix B: Specification 32 36 00-S Structures

For kiosk panel content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

Related Details:

Detail 32 36 14.08-09 Timber Post Brackets

Detail 32 36 14.10 Timber Post Caps

Detail 32 36 14.11-12 Sign Structure: Footings

Detail 32 36 15.02 Sign Frame: Aluminum Kiosk Frame

PEDESTAL SIGN

Interpretive signage is often the preferred method of communicating ecological, historical, and cultural information within Regional Parks. Pedestal signs provide a low-profile and least-invasive option for presenting such interpretive materials.

LOCATION: Pedestal signs may be used within parks at locations of particular interest where it is desirable to provide information or interpretive content about a site feature. They are most commonly located along trails, with the slightly larger lectern preferred for presenting interpretive materials at viewing and seating areas.

STYLE AND MATERIALS: A pedestal sign consists of an aluminum sign frame mounted on a square aluminum post.

PLACEMENT: Generally, pedestal signs should be placed adjacent to or within viewing distance of the site features they describe. Ensure that they are visible and accessible from established trails so that park users can easily locate and use these signs without

disturbing the surrounding landscape. Pedestal sign placement should enhance, not block or dominate, the surrounding park landscape and the features they describe. Avoid using more than two pedestal signs at any given location.



Pedestal sign with interpretive information

PEDESTAL SIGN CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.04 Sign Structure: Pedestal Appendix B: Specification 32 36 00-S Structures

For pedestal panel content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

Related Details:

Detail 32 36 14.11-12 Sign Structure: Footings

LECTERN

The lectern, like the pedestal sign, provides ecological, historical, and cultural information within Regional Parks. Because of its larger size, the interpretive sign structure is used at higher profile locations of where a greater amount of information needs to be communicated.

LOCATION: Lectern may be used within parks at locations of particular interest where it is desirable to provide information or interpretive content about a site feature. They are

most commonly located at viewing and seating areas, while the smaller pedestal sign is used along trails.

STYLE AND MATERIALS: The lectern consists of an aluminum sign frame mounted onto two rough-sawn timber posts complete with black powdercoated brackets, hardware, and post caps.



Lectern

PLACEMENT: Generally, lecterns should be placed adjacent to or within viewing distance of the site features they describe. Ensure that they are visible and accessible from established trails so that park users can easily locate and use these signs without disturbing the surrounding landscape. Lectern placement should enhance, not block or dominate, the surrounding park landscape and the features it describes. A maximum of three lecterns may be used at a single site.

LECTERN CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.03 Sign Structure: Lectern Appendix B: Specification 32 36 00-S Structures

For lectern content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

Related Details:

Detail 32 36 14.08-09 Timber Post Brackets

Detail 32 36 14.10 Timber Post Caps

Detail 32 36 14.11-12 Sign Structure: Footings

Detail 32 36 15.01 Sign Frame: Aluminum Lectern Frame

LOCATION SIGN Location signs, also called 'You-Are-Here' signs, provide park and trail maps to help

PLACEMENT: Location signs should be placed adjacent to a trail in the direct line of sight of trail users. They may be placed perpendicular or at a slight angle to the trail, and should be set back slightly so that those reading the sign do not block the trail.



Location sign at trail intersection

orient users within a park.

Locations: Location signs are installed at secondary park entries, typically at park property line boundaries where trails cross into a park. They may also be installed at locations of potential wayfinding confusion within a park, where directional posts or trail markers are not deemed sufficient (e.g. where multiple trails intersect). Main trailheads/main park entries will already have park and trail maps mounted onto kiosk structures, and so do not require a location sign.

Style and Materials: The location sign structure consists of an aluminum sign frame mounted between two 4½" x 4½" rough-sawn timber posts complete with black powdercoated brackets, hardware, and post caps.

LOCATION SIGN CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.05 Sign Structure: Location Sign Appendix B: Specification 32 36 00-S Structures

For location sign content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

Related Details:

Detail 32 36 14.08-09 Timber Post Brackets

Detail 32 36 14.10 Timber Post Caps

Detail 32 36 14.11-12 Sign Structure: Footings

Detail 32 36 15.03 Sign Frame: Aluminum Location Sign Frame

DIRECTIONAL POST

Direction posts are a wayfinding device used on park trails. They identify trails by supporting trail blazes and directional arrows.

LOCATION: Directional posts may be used anywhere in a park trail system for trail identification at points of potential minor confusion (e.g. at the intersection of two trails).



Directional post with trail marker

STYLE AND MATERIALS: Directional posts are single 6" x 6" rough sawn timber posts

complete with black powdercoated brackets, hardware, and post caps. They support aluminum trail blazes and directional arrows.

PLACEMENT: Directional posts should be placed adjacent to a trail or trail intersection in the direct line of sight of trail users. They should be set back slightly so that those reading the sign do not block the trail. Do not place directional posts within the intersection.

DIRECTIONAL POST CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.06 Sign Structure: Directional Post Appendix B: Specification 32 36 00-S Structures

For directional post content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

Related Details:

Detail 32 36 14.08-09 Timber Post Brackets

Detail 32 36 14.10 Timber Post Caps

Detail 32 36 14.11-12 Sign Structure: Footings

Detail 32 36 15.04 Sign Frame: Trail Marker / Blaze

/ BLAZE

TRAIL MARKER Trail markers/blazes are minor wayfinding devices used on park trails. They provide a visual cue to orient and guide park users along trails, especially along Narrow Multi-Use or Nature trails where, due to surfacing or width, the trail may not be visually distinct from the surrounding landscape.

> LOCATION: Trail markers/blazes may be installed along any trail where minor wayfinding is required along the trail route. They are not intended for use at trail intersections, and will not typically be required along wide or well-used trails (e.g. Major Multi-Use trails) where the trail route is dominant and visually apparent.

> Style and Materials: Trail blazes are aluminum panels and brackets printed with trail identification information as specified in Appendix C: Visual Identity & Graphic Standards. They may be mounted directly onto mature trees adjacent to the trail or, in areas lacking trees, may be mounted onto a 4½" x 4½" rough sawn timber trail marker post complete with black powdercoated hardware and post cap.

> PLACEMENT: Trail blazes are mounted onto trees adjacent to the trail at a height of approximately 1.8m above finished trail grade. The blaze will be located perpendicular to the trail and on the trail side of the tree. Trail marker posts should be placed adjacent to a trail in direct line of sight of trail users, and will likewise have the blaze mounted on the trail side of the post. In both applications, ensure the tree-mounted blaze does not encroach into the cleared trail width where it may pose a hazard to cyclists, exceptionally tall individuals, or children on parents' shoulders.

Trail blazes, whether on tree or post, should be placed to be visible from 30-50m down trail, depending on vegetation density and trail geometry. They do not need to be placed at regular intervals, but consideration should be given to where trail users may require a wayfinding reminder. Blazes will be placed on the right hand side of the trail, when travelling on the trail away from a trailhead or parking lot.





Tree-mounted trail blaze

Trail marker post with blaze

TRAIL MARKER / BLAZE CONSTRUCTION DETAILS AND SPECIFICATIONS

Appendix A: Detail 32 36 14.07 Sign Structure: Blaze Post Appendix B: Specification 32 36 00-S Structures

For trail marker and blaze content and graphic standards, refer to Appendix C: Visual Identity Standards and Appendix D: Regional Parks Sign Guidelines

Related Details:

Detail 32 36 14.08-09 Timber Post Brackets

Detail 32 36 14.10 Timber Post Caps

Detail 32 36 14.11-12 Sign Structure: Footings

Detail 32 36 15.04 Sign Frame: Trail Marker / Blaze

4.3.2 Special Infrastructure

Special infrastructure includes those furnishings and structures that do not have standard construction details or specifications due to their nature as design-build style installations that may require

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engineering or a design response to unique site constraints. The following guidelines are therefore intended to provide information on overall style, materials, placement, and construction that will assist these special projects in fitting with the Regional Parks vocabulary.

PLAYGROUND

Playgrounds are found in some regional parks, offering active play opportunities for children.

LOCATION: Playgrounds should be situated in regional parks where demand warrants their installation. Typically, playgrounds will be placed in Recreation/Cultural/Waterfront parks as more interpretive or passive recreation opportunities are preferred for Conservation, Natural, and Trails/Greenway park management classes.

STYLE AND MATERIALS: Special consideration should be given to the age-range of playground users; tots, young children, and older children often have separate playground areas owing to their differing abilities and play interests. All manufactured playground equipment and elements shall meet current CSA requirements. A range of abilities should be accommodated in playground elements, with a focus on accessibility and inclusion. The use of creative play elements and natural materials is preferred, especially where it provides play and learning opportunities that allow children to relate to nature and site ecology. Playgrounds should feature a range of hard and soft surfaces and should facilitate open-ended play, graduated levels of risk-taking, and flexible use.

For more examples of outdoor learning and play guidelines, see Evergreen Foundation's *Landscape and Child Development*, 2013.

PLACEMENT: Playgrounds should be accessible from parking areas by concrete, asphalt, or compacted granular surfacing. Where applicable, they should be in proximity to park amenities such as washrooms, picnic areas, and open-ended play opportunities such as fields and trails. Seating opportunities should be provided on and near playgrounds for caretaker supervision.

WASHROOM BUILDING

Where servicing is available, washroom buildings with electricity and flush toilets may be installed in Regional Parks.

LOCATION: Washroom buildings must be located in proximity to water, sewer, and electrical services, and must be located to allow easy maintenance access from a public road. Typically, this will be adjacent to a park parking lot and trailhead/main park entrance.

STYLE AND MATERIALS: The washroom building will be timber frame construction in a style and colours compatible with Regional Parks furnishings. It will feature a flush toilet, sink, concrete floor, and where potable water is available, a drinking fountain mounted on outside of the building. Ensure proper permitting and approvals are ob-

tained.



Washroom building at Rose Valley Regional Park

PLACEMENT: Ensure washroom buildings are universally accessible and within easy access of parking areas and main park entries.

DRINKING FOUNTAIN SPECIFICATION

General Use Area: 1107LBP Barrier-Free Wall Mount Fountain by Haws Corporation 1-888-640-4297 or pre-approved equal. Finish: 14 ga satin finish stainless steel

High Use Area: Elkay EZH2O Outdoor Drinking Fountain LK4420BF1UDB with Bottle Filling
Station and Pet Fountain, or pre-approved equal
Distributed by Pro Drinking Fountains 1-888-503-7937
Finish: Powdercoat grey

PICNIC SHELTER

Picnic shelters are large, open-sided, roofed structures sheltering picnic tables and benches. While picnic shelters shall follow a standard style and construction, they have been included in the Special Infrastructure section because of their infrequent use in regional parks, and because of their non-standard sizing. The shelters will be sized to accommodate 15-40 people, depending on park requirements and demand.

LOCATION: Picnic shelters may be placed in Recreation/Cultural/Waterfront parks where demand warrants.

STYLE AND MATERIALS: Picnic shelters are constructed of (8) 10x10" rough-cut timber

posts with timber framing and topped with a green metal roof. A cast-in-place concrete pad underneath the shelter is typical. Ensure proper permitting and approvals are obtained.



Bertram Creek picnic shelter

PLACEMENT: Picnic shelters should be located within a reasonable distance from parking lots and adjacent to a maintenance-vehicle accessible road or trail. The trail or path between the parking area and shelter should be accessible (minimum Type 2: Standard Multi-Use trail) and constructed of either asphalt, concrete, or compacted granular.

Consider views and amenities when placing picnic shelters in parks. Usually, it will offer users convenience to locate them within short distance of washrooms (if provided) and garbage and recycling receptacles, although not so close that odour or excessive pedestrian traffic is an issue. In waterfront parks, placement near beaches or with views of the water will be desirable.

VIEWING PLATFORM

Viewpoints vary in programmatic requirements, and therefore in the types and styles of furnishings that are appropriate at each location. Some locations will warrant little more than a bench to enjoy the view, while other viewpoints may feature important local or regional landmarks, flora and fauna, or ecological features for which interpretive signage or more substantial furnishings or structures may be desirable.

When planning a viewpoint or viewing opportunity for use by park visitors, the following should be considered:

SAFETY

• For areas with steep terrain or potentially unstable substrate, a geotechnical assessment shall be obtained. Avoid disturbance to rock outcrops, cliffs, and

talus slopes.

 Forested areas within or adjacent to viewpoint areas shall undergo a hazard tree/wildlife tree assessment.



Viewing platform in Glen Canyon Regional Park

MAINTENANCE

- Furnishings and layout should be planned with accessibility for maintenance in mind. Viewpoint locations may be remote or inaccessible by maintenance vehicles; these locations may not be appropriate for picnic shelters or destination gathering spots, as trash receptacles cannot be maintained.
- For locations with known undesirable or inappropriate activities (e.g. vandalism, after-hours gatherings), consideration will be given to the suitability of furnishings and structures. For example, shelters that facilitate after-hours gatherings can create litter issues; furnishings that are targets for vandalism create ongoing management issues for parks staff.

SITE-APPROPRIATE DESIGN

- Furnishings and design treatments should be selected to enhance both the park and the viewing experience. Where opportunities for viewpoint furnishings such as kiosks, benches, or picnic shelters are identified, refer to relevant sections within *Section 4 Parks and Trails Design Toolkit*. Alternative furnishings or structures may be approved, but should at minimum meet the requirements outlined in *Section 2 Identity and Character* and *Section 3 General Design Parameters*.
- Furnishings and design treatments should respond to user volume and needs. High-traffic areas may require a greater degree of site organization, seating opportunities, and other amenities; remote locations or low-traffic areas will typically require less intensive designs and fewer furnishings and amenities.

Protect site ecology and habitat. Furnishings and structures should be
integrated with the natural features of the site, and should require minimal
disturbance for installation and maintenance. Locating viewpoints or gathering areas in environmentally sensitive areas should be avoided unless access
can be reasonably limited or monitored.

• Conserve trees and protect their root systems from disturbance; restore disturbed native vegetation.

ENGINEERED BRIDGE

Bridges for pedestrian and maintenance vehicle use are required in some regional parks. Bridges of length greater than 8m or with special site conditions will be designed and approved by a professional structural engineer.

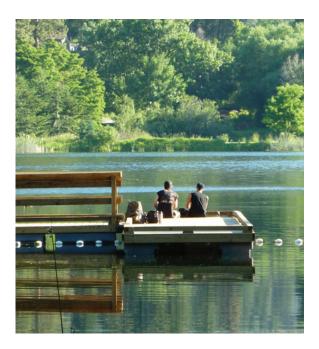
LOCATION: Engineered bridges may be located anywhere in a regional park where required for park user or maintenance access.

STYLE AND **M**ATERIALS: Engineered bridges will be truss-style per engineer's requirements, preferably free span.

PLACEMENT: Place engineered bridges and abutments to minimize impacts on waterways and adjacent landscape. Ensure proper permitting and approvals are obtained prior to construction.

PIER, DOCK & ENGINEERED BOARDWALK

Piers, docks, and engineered boardwalks are used over areas of standing or flowing water and that, for safety and durability, require engineered structures or footings.



Dock at Shannon Lake Regional Park

LOCATION: Piers and floating docks may be located in regional parks where such structures provide access to interpretive features or activities over open water (e.g. viewing, fishing, or nature walks). Engineered boardwalks may be located to mitigate otherwise discontinuous access on trails, such as marshy or seasonally inundated areas or drainage areas that are not appropriate to fill or otherwise bridge, or to provide interpretive opportunities (e.g. over shallow foreshore areas).

STYLE AND MATERIALS: Where possible, timber construction is preferred but is subject to the engineer's requirements. Timber 4" x 4" toe kicks should be provided on all structures, and guardrails may be required dependent on safety or intended activities. Concrete or pile footings may be used for piers and boardwalks dependent on cost, structural requirements, and environmental impact.

PLACEMENT: Place piers, docks, and engineered boardwalks and their footings/abutments to minimize impacts on foreshore and adjacent landscape. Consider adjacent trail surfacing and accessibility in the transition to pier, dock, and engineered boardwalk structures (e.g. a pier should have an accessible ramp if it has an otherwise accessible link to parking areas or trails). Ensure proper permitting and approvals are obtained prior to construction.

PARKING LOT Most regional parks will have one or more parking lots for park users.



Parking lot at Rose Valley Regional Park

LOCATION: Parking lots are most often located in minimally sloped areas at the perimeter of a Regional Park with access to a public roadway. They will often become an activity or amenity "node" for the park, with kiosks, trailheads, washrooms, and other

infrastructure located together for user convenience and ease of maintenance. Consideration may be given to adjacencies of water, sewer, and electrical services if washroom buildings or lighting are desired in or adjacent to the parking area. Where applicable, consult municipal government to determine access or permitting requirements, if any.



Accessible parking stall signs at Gellatly Nut Farm Regional Park

DESIGN: Parking lots may be asphalt or granular material, depending on location and usage. Where applicable, follow municipal guidelines or standards for parking stall quantity and dimensions and drive aisle dimensions. Where such standards are not applicable, standard 90° parking stalls shall be 2.4m wide and 6m long with a 6m wide drive aisle.

Accessible Parking Stalls: Accessible parking spaces will be included in all parking lots, and will be located as close to building entrances, trailheads, or destination as possible. Quantity and dimensions shall meet either municipal requirements or, where not applicable, will be minimum 3.7m wide and 6m long.

In asphalt lots, accessible stalls will display the international symbol for accessibility, painted in a contrasting colour to the pavement colour. The symbol will be a minimum 1m in length and will be centred in each space. In granular lots, where lines and symbols may not be painted to delineate accessible stalls, vertical signage will be installed which displays the international sign for accessibility. Vertical signs shall be a minimum 300mm wide and 300mm high, with the centre of the sign 1.5m off the ground.

APPENDIX A: PARK & TRAIL CONSTRUCTION DETAILS

Section 32 15 51 - S (Off-Road Trails)

32 15 51.01	Trail Type 1: Major Multi-Use
32 15 51.02	Trail Type 2: Standard Multi-Use
32 15 51.03	Trail Type 3: Narrow Multi-Use
32 15 51.04	Trail Type 4: Nature
32 15 51.05	Trail Sideslope
32 15 51.06	Trail in Bedrock
32 15 51.07	Trail Decommissioning
32 15 51.08	Trail Switchback
32 15 51.09	Trail Rolling Dip
32 15 51.10	Trail Water Bar
32 15 51.11	Pipe Culvert
32 15 51.12	Crib Stairs
32 15 51.13	Bike Ramp
32 15 51.14	Metal Handrail Crib Stair Connection
32 15 51 15	Timber Handrail Crib Stair Connection

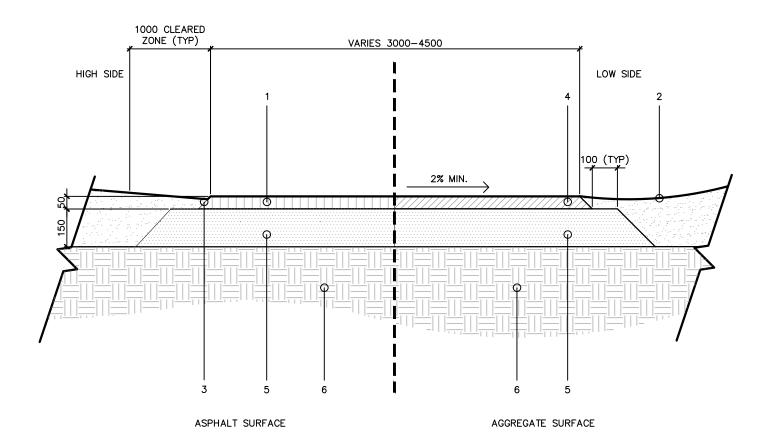
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32 34 10.09 Wetland Boardwalk - Footing Details		
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32 34 10.10 Trail Boardwalk		•
	32 34 10.10	Trail Boardwalk

Section 32 36 00 - S (Fabricated Structures)

32 36 10.01	Comfort Station - Structure
32 36 10.02	Comfort Station - Roof
32 36 13.01	Site-constructed Bench
32 36 13.02	Site-constructed Bench - Aluminum Frame
32 36 14.01	Sign Structure: Park Entry Sign
32 36 14.02	Sign Structure: Kiosk
32 36 14.03	Sign Structure: Lectern
32 36 14.04	Sign Structure: Pedestal
32 36 14.05	Sign Structure: Location Sign
32 36 14.06	Sign Structure: Directional Post
32 36 14.07	Sign Structure: Blaze Post
32 36 14.08	Timber Post Brackets - 1
32 36 14.09	Timber Post Brackets - 2
32 36 14.10	Timber Post Caps
32 36 14.11	Sign Structure Footings - 1
32 36 14.12	Sign Structure Footings - 2
32 36 15.01	Sign Frame: Aluminum Lectern Frame
32 36 15.02	Sign Frame: Aluminum Kiosk Frame
32 36 15.03	Sign Frame: Aluminum Location Sign Frame
32 36 15.04	Sign Frame: Trail Marker / Blaze



- 1 52mm (2") LIFT OF COMPACTED ASPHALT (COMPACT TO MMCD SPEC.)
 2 DRAINAGE SWALE
- 3 TOP SURFACE OF ASPHALT TO BE 13mm ($\frac{1}{2}$ ") ABOVE ADJACENT SURFACE. HAND TAMP EDGES TO 45° ANGLE WHERE ASPHALT MEETS ADJACENT SURFACE
- 4 CRUSHER CHIP (COMPACT TO MMCD SPEC.) GRANULAR BASE
- (COMPACT TO MMCD SPEC.)
- 6 SUBGRADE (COMPACT TO MMCD SPEC.)



- A DRAINAGE SWALES AND CROSS SLOPE DIRECTION VARY IN RESPONSE TO SITE CONDITIONS REFER TO LAYOUT DWGS.

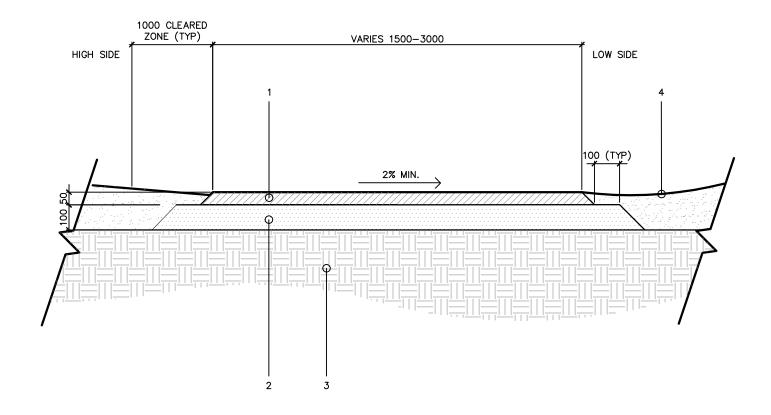
 B TREE BRANCHES WITHIN CLEARED TRAIL ZONE TO BE REMOVED TO PROVIDE 3m VERTICAL CLEARANCE ON BOTH SIDES OF TRAIL

DRAWING TITLE

LAST REVISED DRAWING NO. MAR 18/14 SCALE 1:15



- 1 CRUSHER CHIP
- (COMPACT TO MMCD SPEC.)
 GRANULAR BASE (COMPACT TO MMCD SPEC.)
- 3 SUBGRADE
- (COMPACT TO MMCD SPEC.)
 4 DRAINAGE SWALE

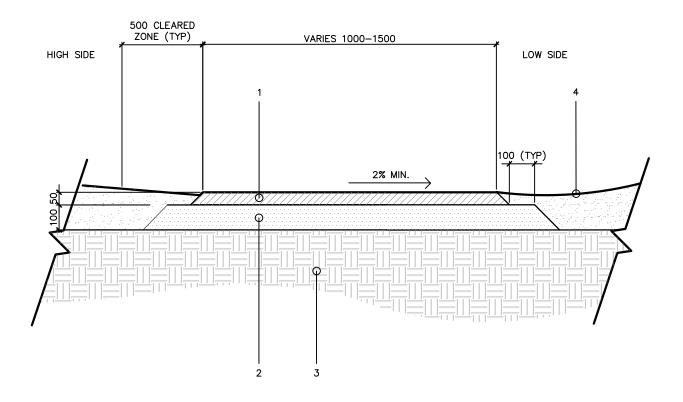


- A DRAINAGE SWALES AND CROSS SLOPE DIRECTION VARY IN RESPONSE TO SITE CONDITIONS REFER TO DWGS.
- B WHERE SUBGRADE (E.G. BEDROCK) DOES NOT ALLOW FULL DEPTH OF EXCAVATION FOR GRANULAR BASE, REFER TO DETAIL NO. 32 15 51.06
 C TREE BRANCHES WITHIN CLEARED TRAIL ZONE TO BE REMOVED TO PROVIDE 3m VERTICAL CLEARANCE ON BOTH SIDES OF TRAIL

1:15



- 1 CRUSHER CHIP
- (COMPACT TO MMCD SPEC.)
- 2 GRANULAR BASE
- (COMPACT TO MMCD SPEC.)
- 3 SUBGRADE
- (COMPACT TO MMCD SPEC.)
- 4 DRAINAGE SWALE



- A DRAINAGE SWALES AND CROSS SLOPE DIRECTION VARY IN RESPONSE TO SITE
- A DRAINAGE SWALES AND CROSS SLOPE DIRECTION VARY IN RESPONSE TO SITE CONDITIONS REFER TO DWGS.

 B WHERE SUBGRADE (E.G. BEDROCK) DOES NOT ALLOW FULL DEPTH OF EXCAVATION FOR GRANULAR BASE, REFER TO DETAIL NO. 32 15 51.06

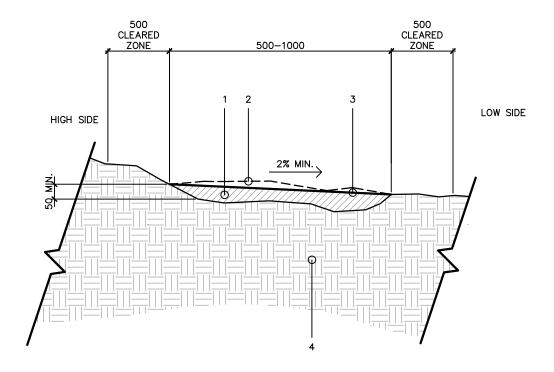
 C TREE BRANCHES WITHIN CLEARED TRAIL ZONE TO BE REMOVED TO PROVIDE 2.5m VERTICAL CLEARANCE ON BOTH SIDES OF TRAIL

 D WHEN CONSTRUCTING TRAIL TYPE ON SIDE SLOPE CONDITIONS, REFER TO DETAIL 32
- 15 51.05

1:15



- . MATIVE SOIL SURFACING
 2 ORIGINAL EXISTING GRADE (NATIVE SOIL, ROCKS, AND BOULDERS)
 3 FINISHED TRAIL GRADE
 4 SUBGRADE



- A CLEAR ALL BRUSH WITHIN TRAIL PATH AND CLEAR ZONES;

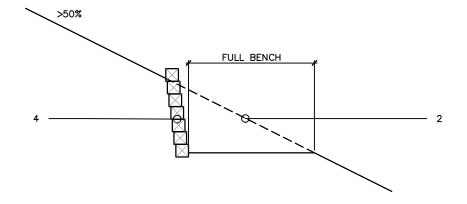
- DISPERSE ON SITE

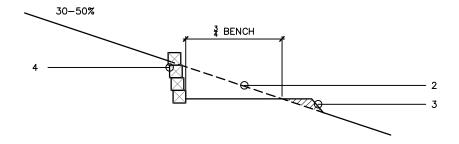
 B REMOVE EXISTING ROCKS AND BOULDERS ON TRAIL PATH AND RE—USE OR DISPERSE ON SITE

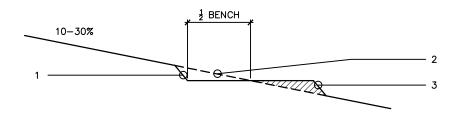
 C REGRADE NATIVE SOIL MATERIAL TO DEFINE FINISHED TRAIL PATH D CROSS SLOPE DIRECTION VARIES IN RESPONSE TO SITE CONDITIONS— REFER TO DWGS.

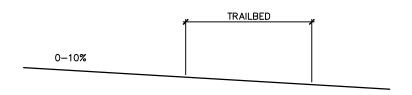
 E TREE BRANCHES WITHIN CLEARED TRAIL ZONE TO BE REMOVED TO PROVIDE 2.5m VERTICAL CLEARANCE ON BOTH SIDES OF TRAIL







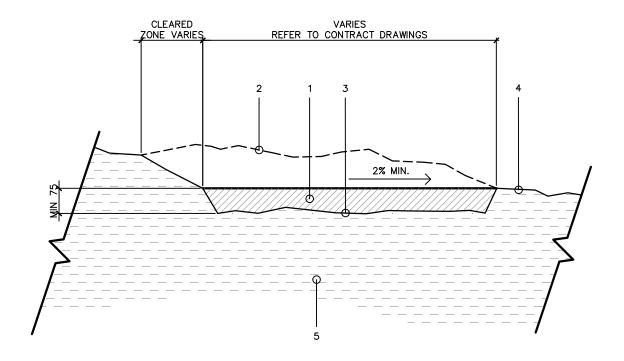




- 1 MAX. 25% CUT SLOPE
 2 ORIGINAL SLOPE
 3 FILL COMPACT TO MMCD SPEC.
 4 FOR SLOPES >30%, GABION RETAINING, TIMBER RETAINING, OR GEOGRID MAY BE REQUIRED TO MINIMIZE SITE IMPACT. SOLUTION IS DEPENDENT ON SITE CONDITIONS REFER TO DWGS.

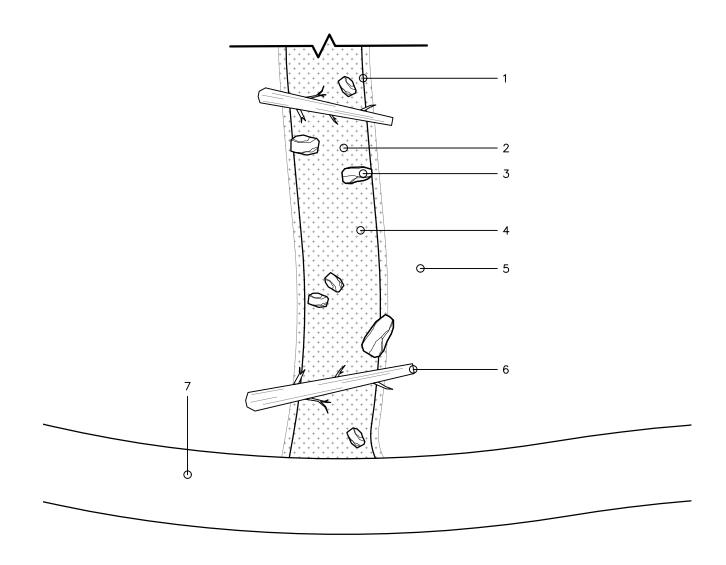


- 1 CRUSHER CHIP (COMPACT TO MMCD SPEC.) 2 ORIGINAL FINISH GRADE
- 3 EXCAVATE SOIL AND/OR BEDROCK TO REQUIRED DEPTH
- 4 EXCAVATE AS REQUIRED TO ALLOW POSITIVE DRAINAGE OFF TRAIL SURFACE
- 5 BEDROCK/SUBGRADE



- A CROSS SLOPE DIRECTION VARIES IN RESPONSE TO SITE CONDITIONS REFER TO DWGS.
- B TREE BRANCHES WITHIN CLEARED TRAIL ZONE TO BE REMOVED TO PROVIDE VERTICAL CLEARANCE ON BOTH SIDES OF TRAIL REFER TO TRAIL TYPE DETAILS



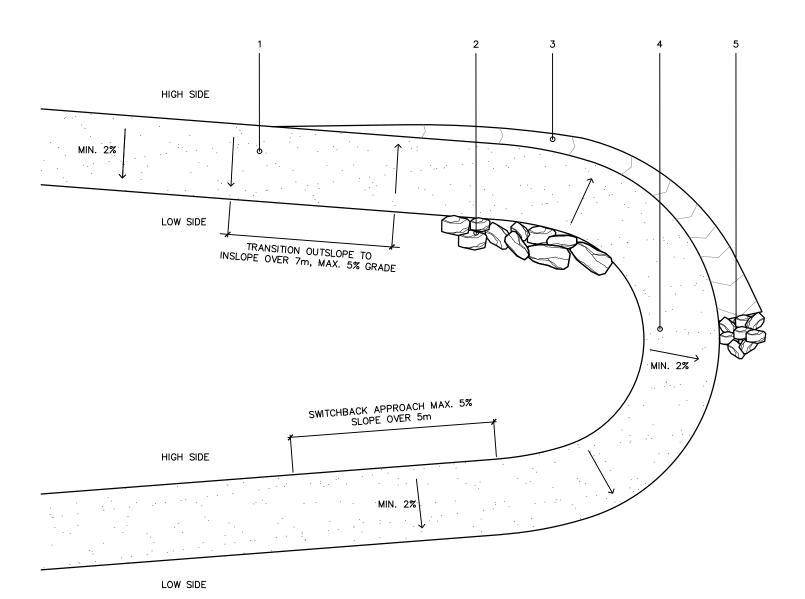


- EDGE OF TRAIL TO BE DECOMMISSIONED
- 2 SCARIFY RESTORATION AREA AND POCKET PLANT WITH NATIVE PLANT PLUGS OF SPECIES APPROPRIATE TO SURROUNDING CONDITIONS. SEED WITH MIX APPROPRIATE TO SURROUNDING CONDITIONS REFER TO SPECIFICATIONS
- 3 NATIVE ROCK/SMALL BOULDERS FROM ADJACENT AREA PLACED RANDOMLY THROUGHOUT RESTORATION AREA 4 MULCH RESTORATION AREA WITH NATIVE MULCH SALVAGED FROM ADJACENT
- AREA; SPRAY WITH MYCELIUM AS PER SPECIFICATIONS
- 5 UNDISTURBED PARKLAND
 6 FALLEN TREE OR LARGE WOODY DEBRIS FROM ADJACENT AREA
- 7 SANCTIONED TRAIL

SUPPLEMENTARY DETAIL DRAWINGS



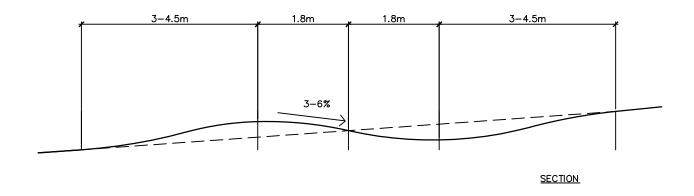
- 1 IRAIL
 2 REINFORCE TRAIL EDGE WITH ROCK AND BOULDER TO PREVENT SHORTCUTTING AND EROSION
 3 DRAINAGE SWALE
 4 MAX. 5% SLOPE THROUGH SWITCHBACK
 5 REINFORCE SWALE EXIT WITH ROCK



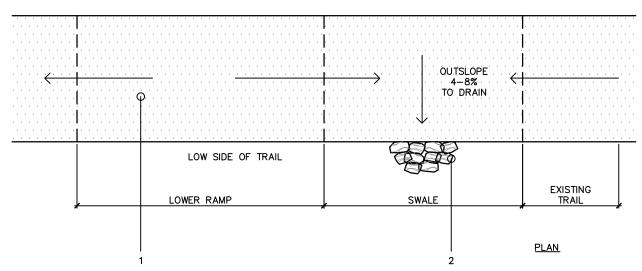
NOTES:

A SWITCHBACKS SHALL BE USED IN CONDITIONS WHERE STAIRS ARE NOT FEASIBLE, OR IN COMBINATION WITH STAIRS TO MINIMIZE TRAIL SLOPE.





HIGH SIDE OF TRAIL



- 1 NATIVE FILL MATERIAL (COMPACT TO MMCD SPEC.) 2 REINFORCE SWALE EXIT WITH RIPRAP

TRAIL SLOPE	ROLLING DIP		
	SPACING		
2-5%	35-55m		
5-10%	25-45m		
10-15%	15-35m		

TABLE A

NOTES:

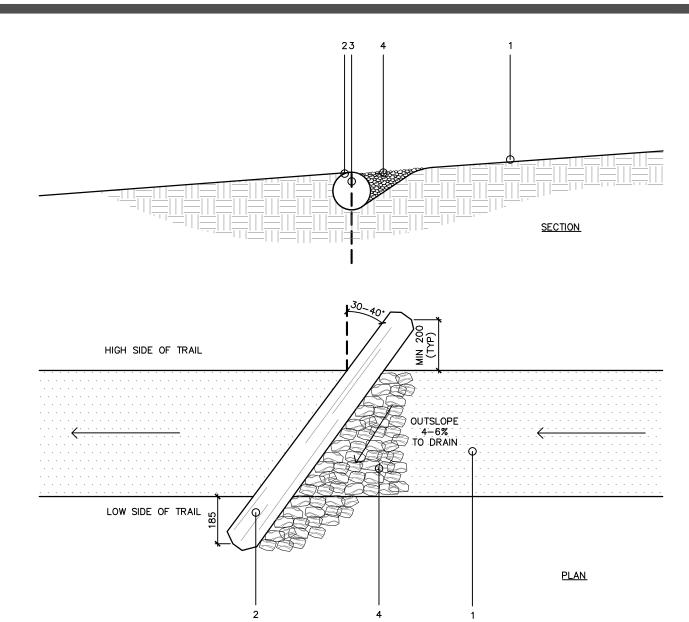
- A DRAINAGE AND CROSS SLOPE DIRECTION VARY IN RESPONSE TO SITE CONDITIONS -REFER TO DWGS.

 B REQUIRED SLOPES AND DIMENSIONS ARE SITE—SPECIFIC AND WILL BE AFFECTED BY
- WATER VOLUMES AND SOIL TYPES

 C THIS DETAIL IS NOT APPROPRIATE FOR TRAILS EXCEEDING 15% SLOPES. FOR STEEPER TRAILS, CRIB STAIRS OR TRAIL REALIGNMENT MAY BE REQUIRED

 D SPACING OF ROLLING DIPS ON TRAIL VARIES REFER TO TABLE A

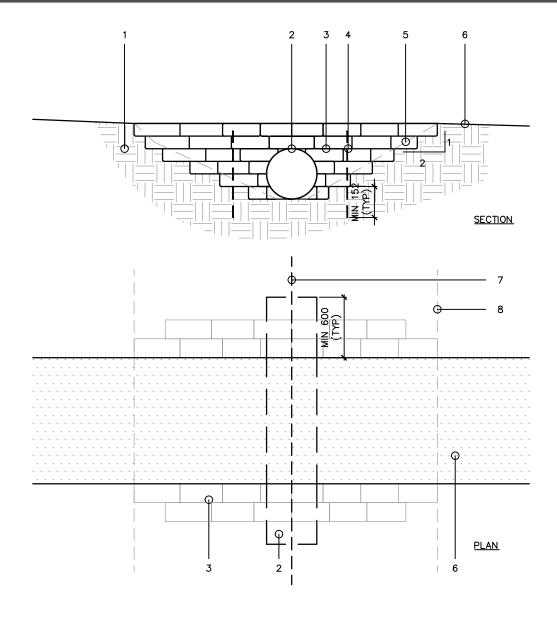




- 2 PEELED LOG, MIN. 252mmø (6"ø), PREDRILLED TO ACCEPT REBAR ANCHORS INSTALL SO TOP OF LOG IS FLUSH WITH DOWNHILL SIDE OF TRAIL SURFACE 3 10M REBAR ANCHOR (2 PER LOG) EXTEND MIN. 610mm (24") INTO COMPACTED SUBGRADE COUNTERSINK REBAR 10mm
- 4 DRAIN ROCK ENSURE FLUSH WITH ADJACENT TRAIL SURFACE EXTEND BEYOND TRAIL TO LOG END TO PREVENT UNDERCUTTING

- A WATERBAR LOCATION AND SPACING DEPENDENT ON EX. TRAIL SLOPE, SOIL TYPE, AND DRAINAGE PATTERN
- B LOG LENGTH VARIES BASED ON TRAIL TYPE REFER TO TRAIL TYPE DETAILS





- 1 SUBGRADE (COMPACT TO MMCD SPEC.)
- 2 RIBBED HDPE CULVERT 305mmø (12"ø) MIN., 610mmø (24"ø) MAX. (REFER TO
- SPEC SECTION 33 42 13)
 3 BURLAP SANDBAG HEADWALL FILL SANDBAGS WITH 4:1 SAND: CEMENT MIX. KEY SANDBAGS A MIN. 152mm (6") INTO DITCH SIDES
 4 REINFORCE SANDBAG HEADWALL WITH NO. 15 REBAR. ENSURE REBAR DOES
- NOT PROTRUDE THROUGH TOP SANDBAGS
- 5 SWALE OR DITCH SIDE SLOPE
- 6 TRAIL SURFACE (REFER TO DWGS. FOR TRAIL TYPE)
- 7 SWALE OR DITCH CENTRE LINE/LOW POINT

A REFER TO SPECIFICATIONS AND CONTRACT DRAWINGS FOR SITE SPECIFIC DIMENSIONS B FILL BETWEEN HEADWALLS TO BE IMPORTED PITRUN FILL GRANULAR BACKFILL WITH 152mm (6") GRANULAR BASE FOR TRAIL SURFACE C LOW END OF CULVERT TO FACE DOWNSTREAM AND TO BE CLEAR OF ENDWALLS

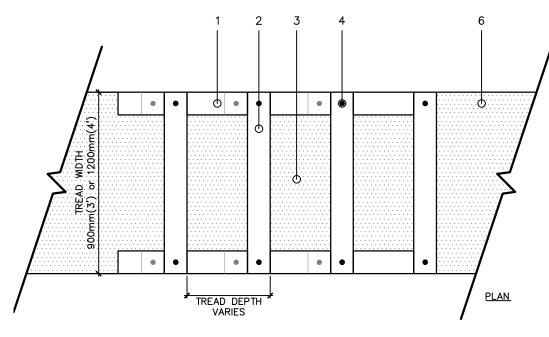
DRAWING TITLE

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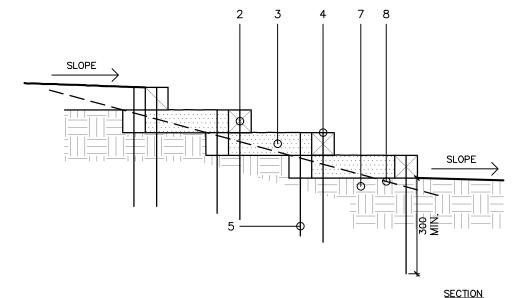
SCALE NTS

15 51.11





- 1 140 X 140mm (6 X 6") PRESSURE TREATED TIMBER STRINGER (TYP.)
- 2 140 X 140mm (6 X 6") PRÈSSURE TREATED TIMBER RISER (TYP.)
 3 BACKFILL STEPS WITH COMPACTED
- NATIVE MINERAL SOIL OR CRUSHER CHIP AS REQUIRED, FINISH SMOOTH TO TOP OF STEP
- 4 INSERT 10M REBAR THROUGH PREDRILLED HOLES; REBAR TO SIT FLUSH WITH TIMBER 5 REBAR TO EXTEND INTO
- SUBGRADE MIN. 305mm (12") ADJACENT HARD SURFACE
- REFER TO LAYOUT DWGS UNDISTURBED SUBGRADE
- 8 EX. SUBGRADE SLOPE



TREAD
DEPTH
0.60m
0.45m
0.30m

TABLE A

NOTES:

- A 3 RISERS MINIMUM
 - (I.E. MINIMUM OF 3 RISERS TO A SET OF STAIRS)
- B DESIRED TREAD DEPTH IS 305-610mm (12-24"); REFER TO TABLE A C STAIR TREAD WIDTH VARIES PER TRAIL TYPE REFER TO PROJECT DWGS. AND SCHEDULE OF QUANTITIES FOR WIDTH
- OF QUANTITIES FOR WIDTH

 MAINTAIN RISE:RUN FOR ENTIRE LENGTH OF STAIRCASE

 E ALL WOOD TIMBER SHALL BE PRESSURE TREATED AND MEET UC4.1 AS PER CSA.080.1

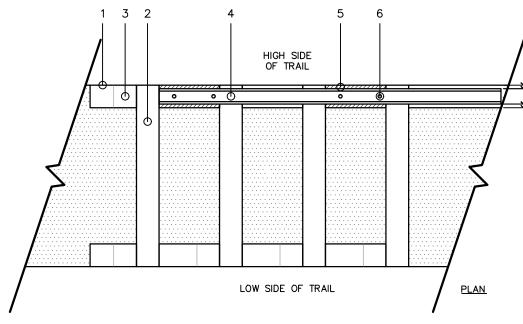
 F WHERE METAL HANDRAIL IS SPECIFIED, REFER TO SUPPLEMENTARY DETAIL 32 15 51.14

 G WHERE TIMBER HANDRAIL IS SPECIFIED, REFER TO SUPPLEMENTARY DETAIL 32 15 51.15

 H WHEN BIKE RAMP IS SPECIFIED, REFER TO SUPPLEMENTARY DETAIL 32 15 51.13

LAST REVISED DRAWING NO AUG 28/14 15 51.12 SCALE 1:25

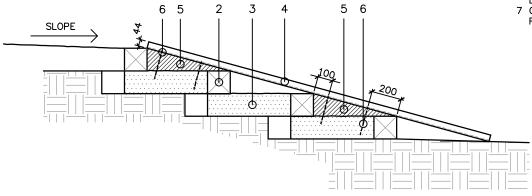




- 1 CRIB STAIRS REFER TO SUPPLEMENTARY DETAIL 32 15 51.12 2 140 X 140mm (6 X 6") PRESSURE
- TREATED TIMBER RISER (TYP.)

8

- 3 140 X 140mm (6 X 6") PRESSURE TREATED TIMBER STRINGER (TYP.)
- 4 52 X 101mm (2 X 4") 6061-T6 (AA) ALUMINUM C CHANNEL PAINTED **BLACK**
- SUPPORT WEDGE CUT FROM 140 X 140mm (6 X 6") PRESSURE TREATED TIMBER. PROVIDE WEDGES AT TOP AND BOTTOM TREADS, AND EVERY SECOND TREAD DEPENDING ON QUANTITY OF RISERS. AFFIX WEDGE TO TOP OF STRINGER WITH CONSTRUCTION ADHESIVE.
- 6 (2) 76mm (3") SIMPSON STRONG DRIVE TIMBER SCREWS (MODEL # SDWS22600DB) AT EACH MOUNTING LOCATION
- 7 C CHANNEL TO MEET AND MATCH FINISHED GRADE OF TRAIL



SECTION

NOTES:

- A REFER TO DRAWING 32 15 51.12 FOR CRIB STAIR DETAIL

 B ALL HARDWARE TO BE HOT DIPPED GALVANIZED

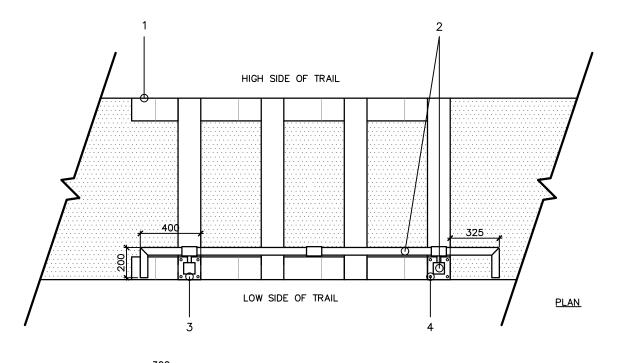
 C C CHANNEL TO HAVE A SMOOTH TRANSITION ON THE TOP RISER AND AT THE FINISHED GRADE ADJACENT TO THE BOTTOM RISER

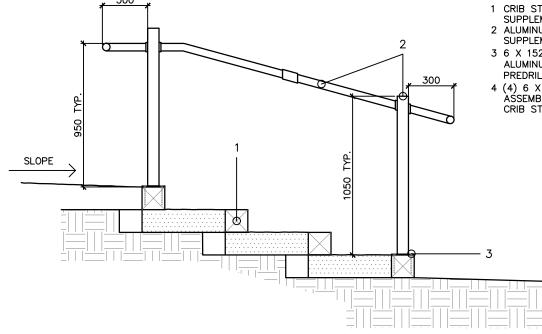
 TO THE BOTTOM RISER

 TO THE BOTTOM RISER

 THE PLANTAGE AND ADDRESS OF T
- D ALL ALUMINUM TO BE PAINTED (RAL 9005, "JET BLACK") OR APPROVED EQUAL
- E CRIB STAIRS TO BE IN LINEAR ALIGNMENT WHEN BIKE RAMP IS REQUIRED







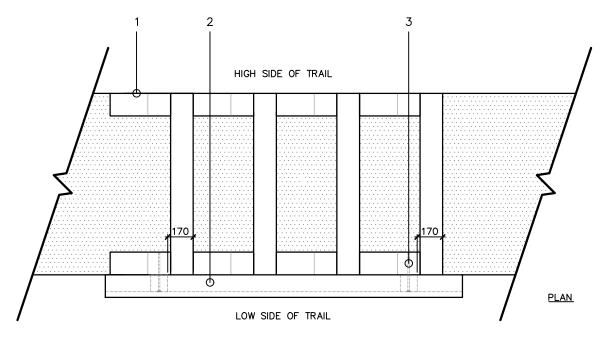
- CRIB STAIRS REFER TO
- SUPPLEMENTARY 32 15 51.12
 ALUMINUM HANDRAIL REFER TO
 SUPPLEMENTARY DETAIL 32 31 10.07
- 3 6 X 152 X 152mm (‡ X 6 X 6") ALUMINUM FLANGE W/ (4) PREDRILLED HOLES WELDED TO POST
- (4) 6 X 125mm (1 X 5") LAG SCREW ASSEMBLY FOR SURFACE MOUNT TO CRIB STAIRS

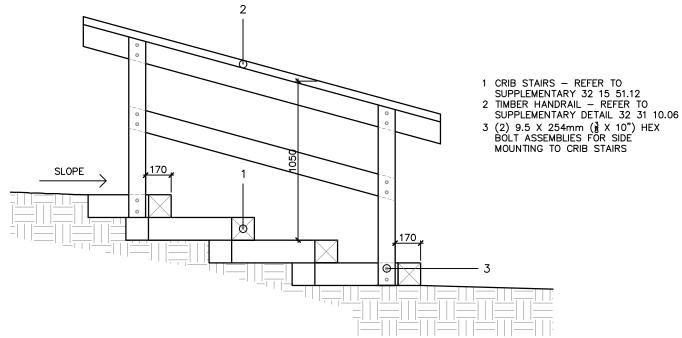
SECTION

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED B HANDRAIL POST LAYOUT SHALL BE MOCKED UP AND APPROVED PRIOR TO INSTALLATION C ALL ALUMINUM TO BE PAINTED (RAL 9005, "JET BLACK") OR APPROVED EQUAL

LAST REVISED DRAWING NO. AUG 28/14 15 51.14 SCALE 1:25







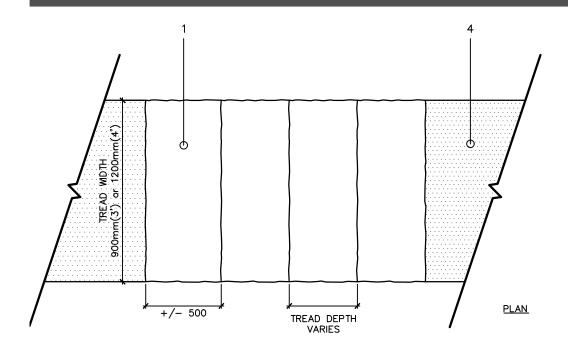
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NOTES:

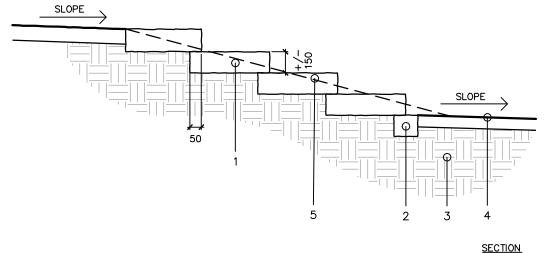
- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED
 B HANDRAIL POST LAYOUT SHALL BE MOCKED UP AND APPROVED PRIOR TO INSTALLATION
 C HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER AND NUT.
 D COUNTERSINK ALL BOLTS TO THE SPECIFIED WASHER SIZE AND TO ENSURE THE BOLTS
 DO NOT EXTEND BEYOND SURFACE OF THE POST.

LAST REVISED DRAWING NO. AUG 28/14 15 51.15 SCALE 1:25





- 1 STONE SLAB RISER (TYP.) 2 STONE SLAB BASE COURSE
- 3 SUBGRADE (COMPACT TO MMCD SPEC.)
- 4 ADJACENT SURFACE (REFER TO
- PROJECT DWGS.)
 5 EX. SUBGRADE SLOPE



EX. SUBGRADE	TREAD
SLOPE	DEPTH
25%	0.60m (24")
33%	0.45m (18")
50%	0.30m (12")

TABLE A

NOTES:

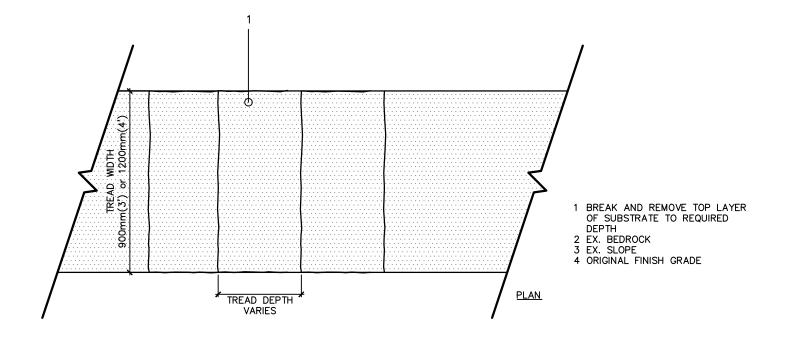
- A 3 RISERS MINIMUM
- (I.E. MINIMUM OF 3 RISERS TO A SET OF STAIRS)

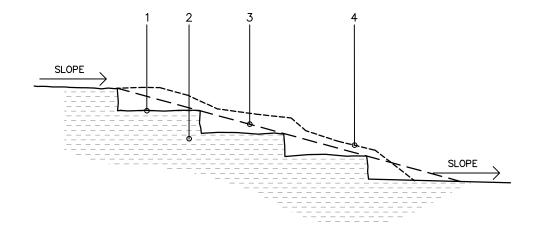
 B DESIRED TREAD DEPTH IS 305-610mm (12-24"); REFER TO TABLE A

 C STAIR TREAD WIDTH VARIES PER TRAIL TYPE REFER TO PROJECT DWGS. AND SCHEDULE OF QUANTITIES FOR
- D MAINTAIN RISE: RUN FOR ENTIRE LENGTH OF STAIRCASE E STONE SLABS TO BE SITE SOURCED

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EX. SUBGRADE	TREAD
SLOPE	DEPTH
25%	0.60m (24")
33%	0.45m (18")
50%	0.30m (12")

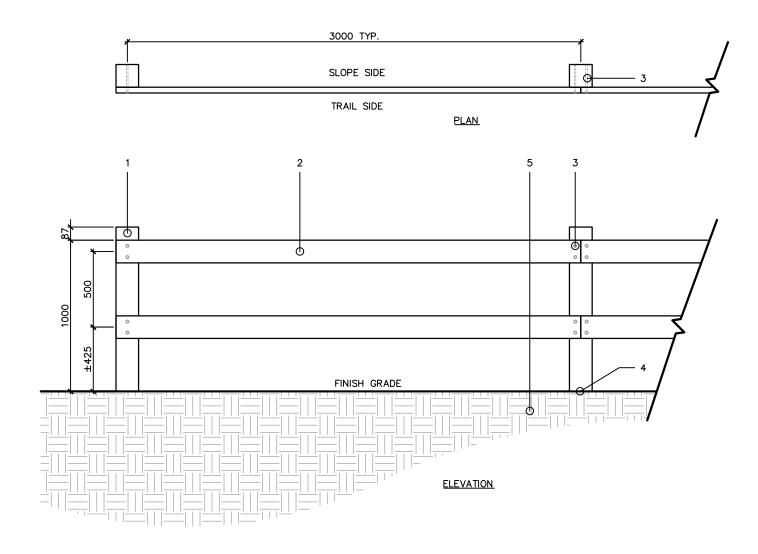
TABLE A

SECTION

NOTES:

- A 3 RISERS MINIMUM
- (I.E. MINIMUM OF 3 RISERS TO A SET OF STAIRS)
- B DESIRED TREAD DEPTH IS 305-610mm (12-24"); REFER
- TO TABLE A
 C STAIR TREAD WIDTH VARIES PER TRAIL TYPE REFER TO
 PROJECT DWGS. AND SCHEDULE OF QUANTITIES FOR WIDTH
 D MAINTAIN RISE: RUN FOR ENTIRE LENGTH OF STAIRCASE





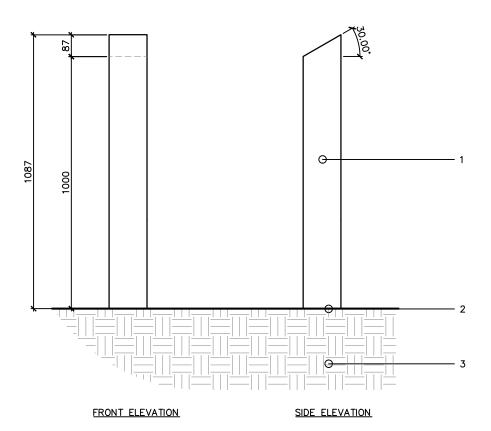
- 1 152 X 152mm (6 X 6") ROUGH SAWN DOUGLAS FIR POST, TOPS CHAMFERED @ 30 DEGREES AWAY FROM TRAIL. POST LENGTH DEPENDENT ON FOOTING TYPE
- 2 51 X 152mm (2 X 6") ROUGH SAWN DOUGLAS FIR
- 3 ATTACH RAILS TO POST WITH 10 X 203mm (\S X 8") HEX BOLT ASSEMBLIES. HEAD OF BOLT TO FACE TRAIL
- 4 GUARDRAIL BOLLARD FOOTING. FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 31 10.08
 5 UNDISTURBED SUBGRADE

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL
- B HEX BOLT ASSEMBLY INCLUDES 10mm (3") HEX BOLT
- B HEX BOLT ASSEMBLY INCLUDES 10mm (§") HEX BOLT W/ WASHER AND NUT. BOLT LENGTH VARIES
 C COUNTERSINK ALL BOLTS TO THE SPECIFIED WASHER SIZE AND SO THAT THE BOLTS DO NOT EXTEND BEYOND SURFACE OF THE RAIL.
 D ALL WOOD TIMBER TO BE FULL DIMENSION ROUGH CUT DOUGLAS FIR—L #2 OR BETTER
 E ALL WOOD COMPONENTS TO BE STAINED WITH (2)
- COATS OF SIKKENS CETOL 1, COLOUR NATURAL 078' F FIR RAILS TO BE FREE OF DEFECTS AND BLEMISHES

LAST REVISED DRAWING NO AUG 28/15 10.01 SCALE 1:25

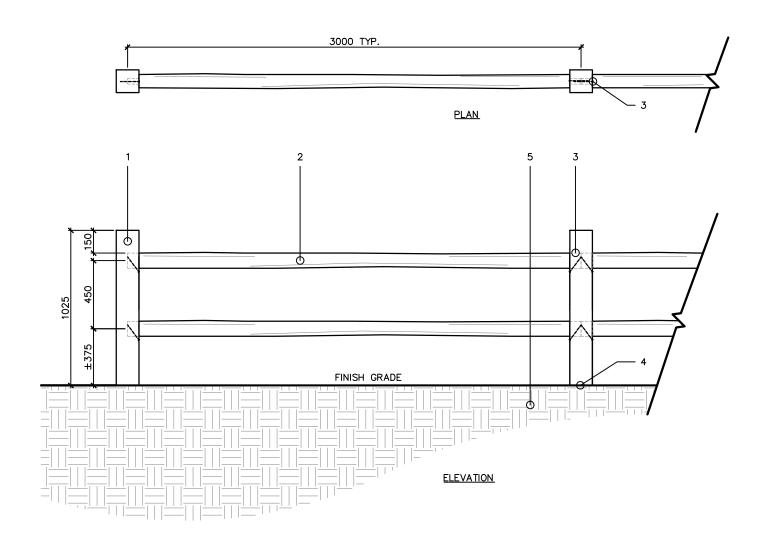


- 1 152 X 152mm (6"X6") ROUGH SAWN DOUGLAS FIR POST, TOPS CHAMFERED @
- 30 DEGREES AWAY FROM TRAIL. POST LENGTH DEPENDENT ON FOOTING TYPE
 2 GUARDRAIL/BOLLARD FOOTING. FOOTING TYPE IS DEPENDENT ON SITE
 CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 31 10.08
 3 UNDISTURBED SUBGRADE



A WOOD TO BE FULL DIMENSION ROUGH CUT DOUGLAS FIR-L #2 OR BETTER B ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF SIKKENS CETOL 1, COLOUR 'NATURAL 078'





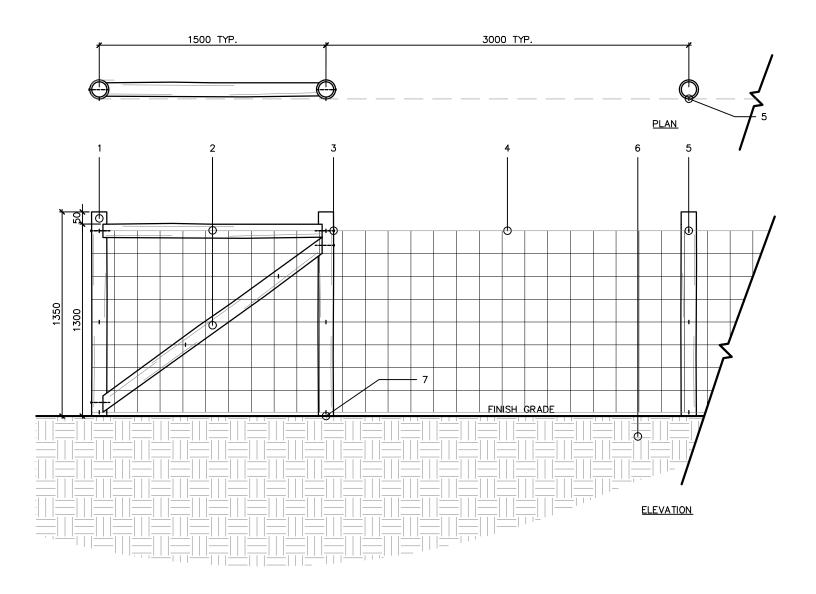
- 1 152 X 152mm (6 X 6") SPLIT RAIL CEDAR POST WITH POST HOLE
 2 127 X 127mm (5 X 5") SPLIT RAIL CEDAR WITH
- 76mm (3") TONGUE
- ATTACH RAIL TONGUE TO POST HOLES WITH 76mm (3") LONG DECK SCREWS
- 4 FOOTING TO BE EMBEDDED INTO NATIVE SOIL A MINIMUM OF 914mm (3')
 5 UNDISTURBED SUBGRADE

- A ALL HARDWARE TO BE HOT DIPPED
- GALVANIZED STEEL

 B ALL WOOD TIMBER TO BE SPLIT CEDAR

1:25





- 1 127mm (5") Ø ROUND POST 2 127mm (5") Ø ROUND RAILS FOR CORNER/END POST TERMINATION
- 3 DADO 25mm (1") OUT OF EACH POST TO ATTACH RAILS TO POST. SECURE W/ 76mm (3") LONG DECK SCREWS
- 4 $12\frac{1}{2}$ GA. GALVANIZED FENCING
- 5 ATTACH FENCING TO POST WITH #9 32mm (117) GALVANIZED STEEL STAPLES (MIN. 3 PER POST)
- 6 UNDISTURBED SUBGRADE
 7 FOOTING TO BE EMBEDDED INTO NATIVE SOIL A MINIMUM OF 914mm (3')

NOTES:

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B ALL WOOD COMPONENTS TO BE PRESSURE TREATED C FENCING TO BE GAME & CATTLE FENCING FROM TREE ISLAND STEEL (604) 524-3744 OR APPROVED EQUAL

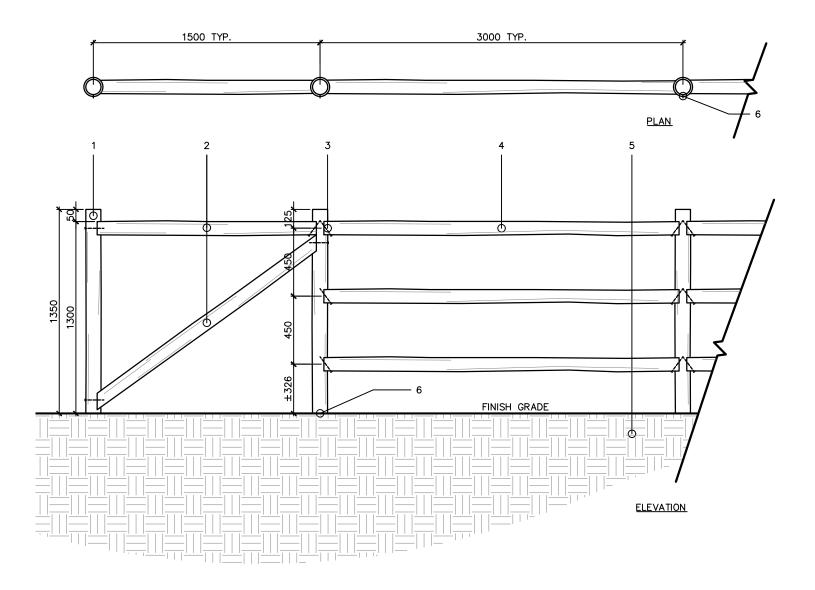
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LAST REVISED AUG 28/15 SCALE

DRAWING NO.

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- 1 127mm (5") Ø ROUND POST 2 127mm (5") Ø ROUND RAILS FOR CORNER/END POST TERMINATION
- 3 DADO 25mm (1") OUT OF EACH POST TO ATTACH RAILS TO POST. SECURE W/ 76mm (3") LONG DECK SCREWS

- 4 (3) 127mm (5") Ø ROUND RAILS
 5 UNDISTURBED SUBGRADE
 6 FOOTING TO BE EMBEDDED INTO NATIVE SOIL A MINIMUM OF 914mm (3')

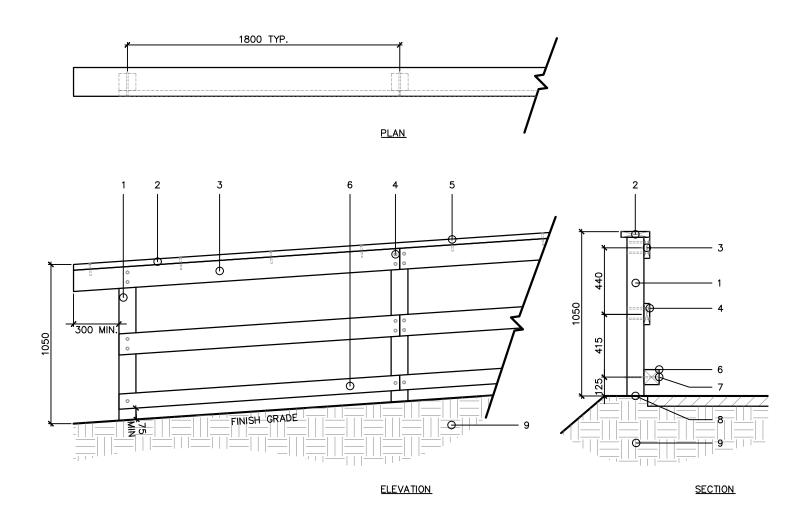
- A ALL HARDWARE TO BE HOT DIPPED
- GALVANIZED STEEL

 B ALL WOOD COMPONENTS TO BE
 PRESSURE TREATED

DRAWING TITLE

31



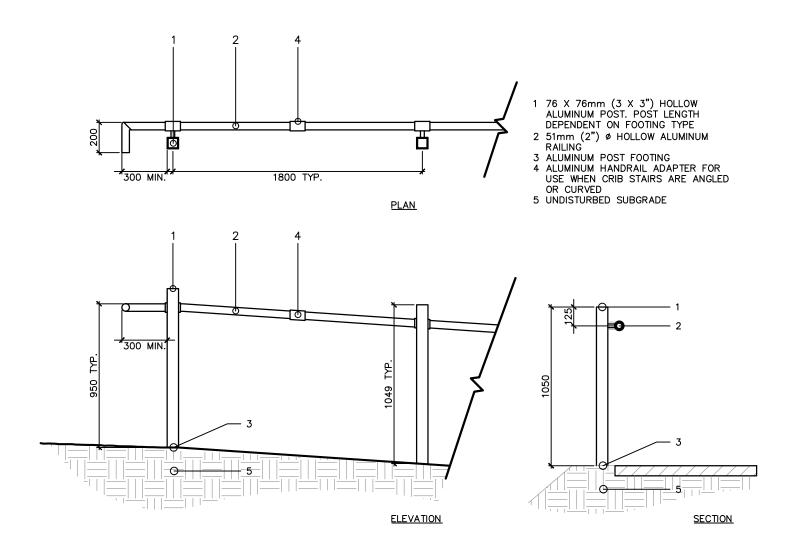


- 1 112 X 112mm (4½ X 4½") ROUGH SAWN DOUGLAS FIR POST. POST LENGTH DEPENDENT ON FOOTING TYPF
- 2 38 X 184mm (2 X 8") DIMENSIONAL DOUGLAS FIR HANDRAIL
- 3 38 X 140mm (2 X 6") DIMENSIONAL DOUGLAS FIR SIDE RAILS
- 4 ATTACH RAILS TO POST WITH 9.5 X 152mm (X 6") LENGTH HEX BOLT ASSEMBLY. HEAD OF BOLT TO FACE TRAIL
- 5 ATTACH HANDRAIL TO TOP SIDE RAIL W/ 76mm (3") SIMPSON STRONG DRIVER SCREWS (MODEL # SDWS22600DB) @ 610mm (24") O.C. FLUSH TO **TOPRAIL**
- 6 (OPTIONAL) 89 X 89mm (4 X 4") DIMENSIONAL DOUGLAS FIR BASE RAIL.
- (OPTIONAL) ATTACH RAIL TO POST WITH (1) 9.5 X 229mm (🖁 X 9") LENGTH HEX BOLT ASSEMBLY. HEAD OF BOLT TO FACE TRAIL
- 8 HANDRAIL POST FOOTING
- UNDISTURBED SUBGRADE

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER AND NUT. C COUNTERSINK ALL BOLTS TO THE SPECIFIED WASHER SIZE AND TO ENSURE THE BOLTS DO NOT EXTEND BEYOND SURFACE OF THE RAILS.
- D ALL POSTS SHALL BE FULL DIMENSION ROUGH CUT DOUGLAS FIR-L #2 OR BETTER
- E ALL HÄNDRAIL AND SIDE RAILS SHALL BE S4S LUMBER / PLANNED ALL FOUR (4) SIDES
- F ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF SIKKENS CETOL 1, COLOUR 'NATURAL 078'
- G FIR RAILS TO BE FREE OF DEFECTS AND BLEMISHES H FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 31 10.09

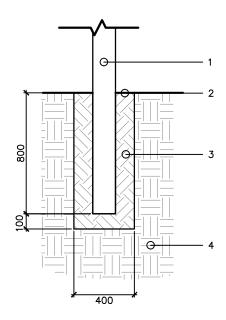
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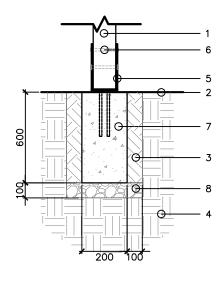




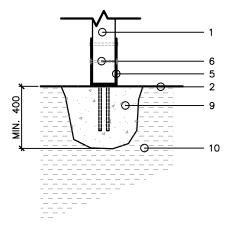
- A ALL WELDS SHALL BE CONTINUOUS, CLEAN AND ALL BURRS TO BE REMOVED PRIOR TO POWDER COATING
 B ALL ALUMINUM TO BE PAINTED (RAL 9005, "JET BLACK") OR APPROVED
- C FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 31 10.09







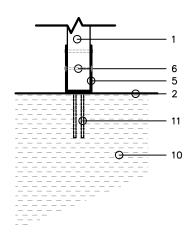
EMBEDDED POST OPTION



FRACTURED ROCK MOUNT OPTION

- 1 GUARDRAIL/BOLLARD POST REFER TO SUPPLEMENTARY DETAILS 32 31 10.01 & 32 31 10.02
- 2 FINISH GRADE
 3 BACKFILL AND COMPACT WITH NATIVE SOIL
 4 UNDISTURBED SUBGRADE
 5 150 × 150 mm (6 × 6") TIMBER POST BRAI
- 5 152 X 152mm (6 X 6") TIMBER POST BRACKET (SUPPLIED BY THE RDCO) REFER TO SUPPLEMENTARY DETAIL 32 36 14.08
- 6 ATTACH BRACKET TO POST WITH (2) 16 X 178mm (§ X 7") LENGTH HEX BOLT ASSEMBLIES
 7 CIP CONCRETE FOOTING
- 8 GRANULAR BASE (COMPACT TO MMCD SPEC.)
- 9 CONCRETE FOOTING IN BEDROCK; BREAK AND REMOVE TOP LAYER OF SUBSTRATE TO MIN. 406mm (16") DEPTH OR TO SOLID BEDROCK

CONCRETE FOOTING OPTION



SOLID ROCK MOUNT OPTION

10 EX. BEDROCK

11 DRILL HOLE FOR REBAR AND USE "HILTI HIT HY 200 EPOXY" OR APPROVED EQUAL TO MOUNT TO SOLID ROCK

NOTES:

- A FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS AND SHALL BE DETERMINED ON SITE PRIOR TO INSTALLATION

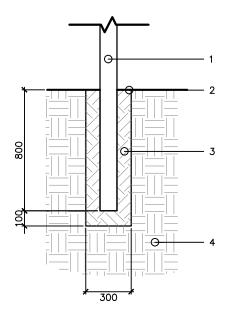
 B ALL HARDWARE TO BE HOT DIPPED
- GALVANIZED STEEL
 C HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER AND NUT.

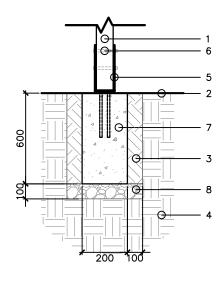
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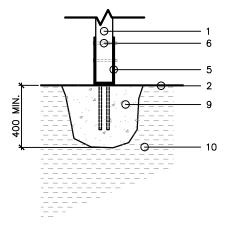
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EMBEDDED POST OPTION

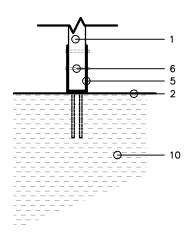


FRACTURED ROCK MOUNT OPTION

- 1 HANDRAIL POST REFER TO SUPPLEMENTARY DETAIL 32 36 14.06 FINISH GRADE
- 3 BACKFILL AND COMPACT WITH NATIVE SOIL 4 UNDISTURBED SUBGRADE
- SUPPLEMENTARY DETAIL 32 36 14.08
 6 ATTACH BRACKET TO POST WITH (2) 16 X 152mm
- (§ X 6") LENGTH HEX BOLT ASSEMBLIES
 7 C.I.P. CONCRETE FOOTING
 8 GRANULAR BASE (COMPACT TO MMCD SPEC.)

- CONCRETE FOOTING IN BEDROCK; BREAK AND REMOVE TOP LAYER OF SUBSTRATE TO MIN. 406mm (16") DEPTH OR TO SOLID BEDROCK

CONCRETE FOOTING OPTION



SOLID ROCK MOUNT OPTION

10 EX. BEDROCK

11 DRILL HOLE FOR REBAR AND USE "HILTI HIT HY 200 EPOXY" OR APPROVED EQUAL TO MOUNT TO SOLID ROCK

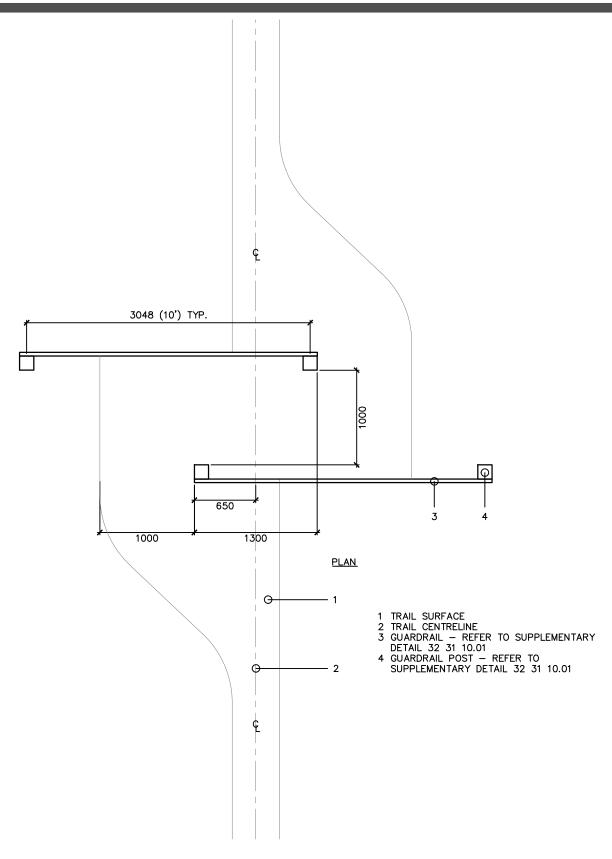
NOTES:

- A FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS AND SHALL BE DETERMINED ON SITE PRIOR TO INSTALLATION
- B ALL HARDWARE TO BE HOT DIPPED
- GALVANIZED STEEL
- C HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER AND NUT.

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LAST REVISED DRAWING NO AUG 28/15 SCALE 1:25





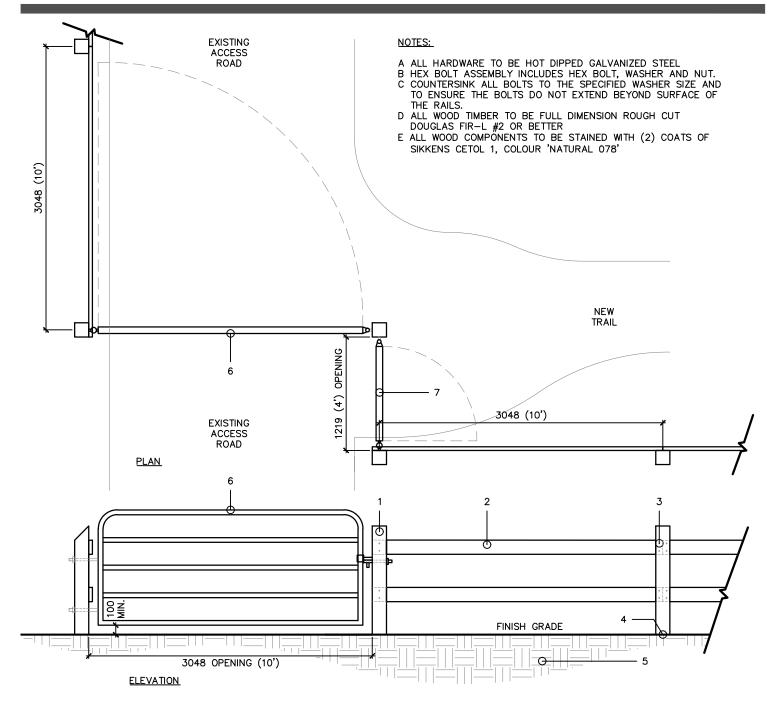
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AUG 28/15
SCALE
1:40

32 31 10.10

DRAWING NO.



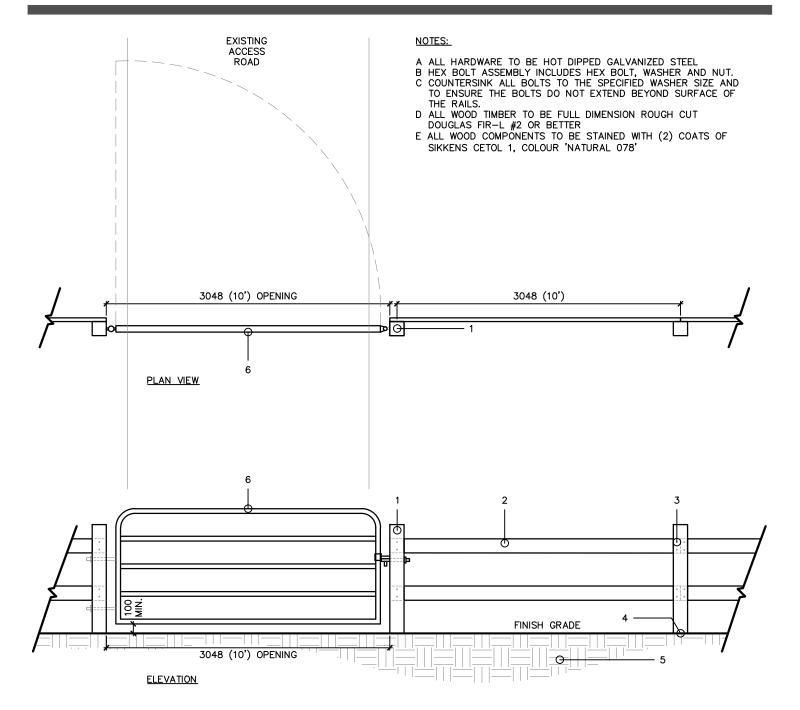


- 1 TIMBER BOLLARD REFER TO
- SUPPLEMENTARY DETAIL 32 31 10.02
 2 GUARDRAIL REFER TO SUPPLEMENTARY DETAIL 32 31 10.01
- 3 ATTACH RAILS TO POST WITH 10 X 203mm
- (§ X 8") LENGTH HEX BOLT ASSEMBLY. HEAD OF BOLT TO FACE TRAIL
 4 GUARDRAIL POST FOOTING. FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 31 10.08
- 5 UNDISTURBED SUBGRADE

- 6 3048mm (10') 5-RAIL ALUMINUM FARM GATE SUPPLIED BY LYNX BRAND FENCE PRODUCTS 250-765-1468 ATTACH TO WOODEN FENCE POSTS USING (2) THROUGH BOLT HINGES AND (1) LOCKABLE ROLLO LATCH ASSEMBLY
- 1220mm (4') 5-RAIL ALUMINUM FARM GATE SUPPLIED BY LYNX BRAND FENCE PRODUCTS 250-765-1468

ATTACH TO WOODEN FENCE POSTS USING (2) THROUGH BOLT HINGES AND (1) LOCKABLE FORK LATCH ASSEMBLY





- 1 TIMBER BOLLARD REFER TO SUPPLEMENTARY DETAIL 32 31 10.02
- GUARDRAIL REFER TO SUPPLEMENTARY DETAIL 32 31 10.01
- 3 ATTACH RAILS TO POST WITH (2) 10 X 203mm
- (§ X 8") LENGTH HEX BOLT ASSEMBLY. HEAD OF BOLT TO FACE TRAIL
 4 GUARDRAIL POST FOOTING. FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 31 10.08
- 5 UNDISTURBED SUBGRADE
- S UNDISTURBED SUBGRADE

 5 0048mm (10') 5-RAIL ALUMINUM FARM GATE

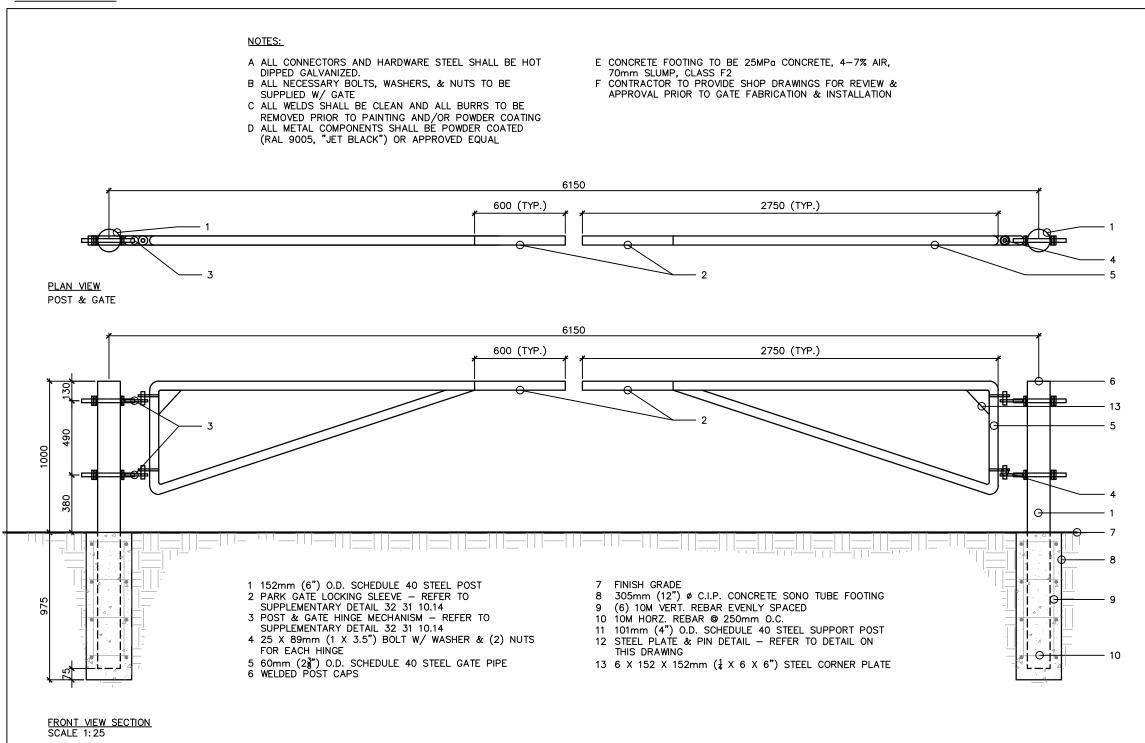
 SUPPLIED BY LYNX BRAND FENCE PRODUCTS

 250-765-1468 ATTACH TO WOODEN FENCE

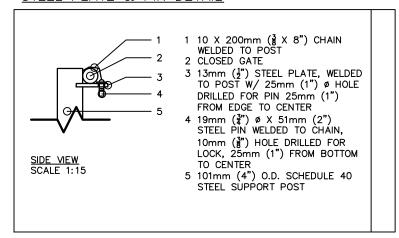
 POSTS USING (2) THROUGH BOLT HINGES AND (1) LOCKABLE ROLLO LATCH ASSEMBLY



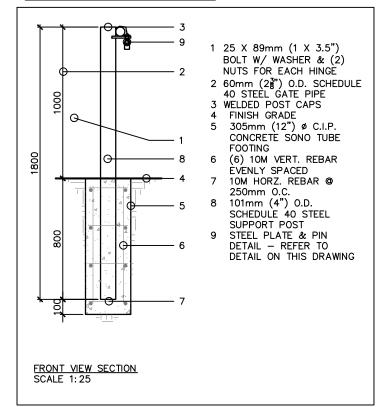
POST & GATE



STEEL PLATE & PIN DETAIL

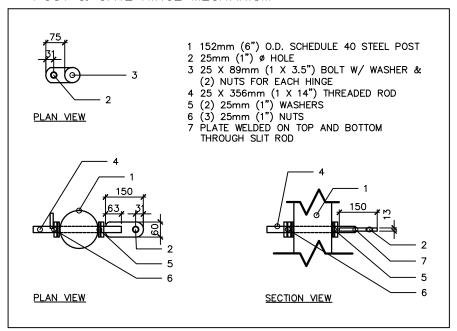


RECEIVING SUPPORT POST

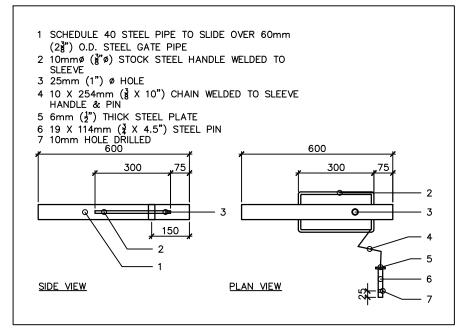




POST & GATE HINGE MECHANISM



PARK GATE LOCKING SLEEVE



NOTES:

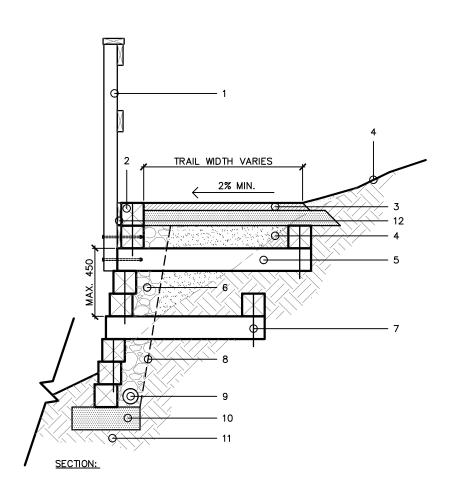
- A ALL CONNECTORS AND HARDWARE STEEL SHALL BE HOT DIPPED GALVANIZED.
- B ALL NECESSARY BOLTS, WASHERS, & NUTS TO BE SUPPLIED W/ GATE
- C ALL WELDS SHALL BE CLEAN AND ALL BURRS REMOVED PRIOR TO POWDER COATING
- D ALL METAL COMPONENTS SHALL BE POWDER COATED (RAL 9005, "JET BLACK") OR APPROVED EQUAL

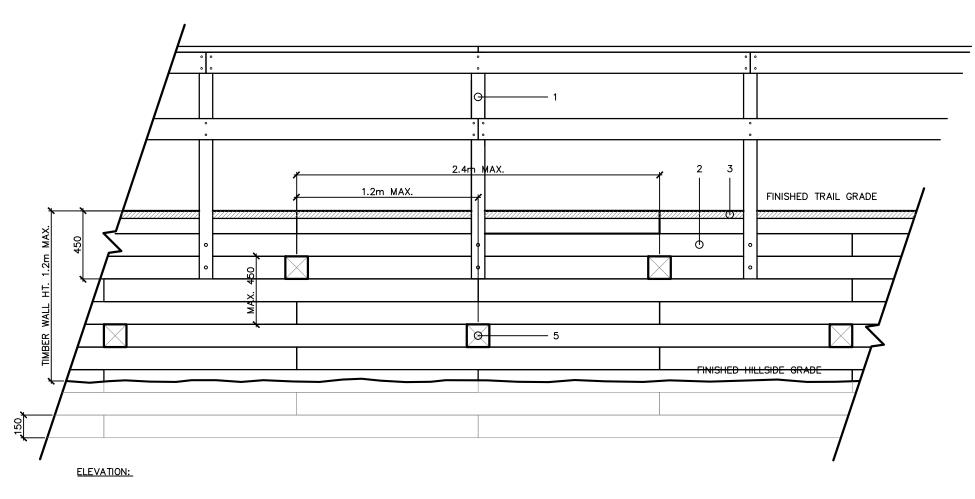
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EL VINDER OF THE OFFICE OFFICE OF THE OFFICE OFFICE







- A TIMBER DEADMAN TO EXTEND INTO SUBGRADE A MIN. OF 305mm.
- B ALL WOOD TIMBER TO BE PRESSURE TREATED
- C WALLS SHALL NOT EXCEED 1220mm (4') IN HEIGHT.
 ANY WALL EXCEEDING 1220mm (4') SHALL BE LOWERED
 TO MAX HEIGHT OR HAVE WRITTEN APPROVAL FROM A STRUCTURAL OR GEOTECHNICAL ENGINEER.
- D TIMBER HANDRAIL REQUIRED WHEN HT. OF RETAINING WALL EXCEEDS 610mm (2') UNLESS OTHERWISE NOTED

- 1 TIMBER HANDRAIL W/ LAG BOLT CONNECTION, REFER TO DETAIL 32 15 51.15 (IF REQUIRED)
- 2 140 x 140mm (6 X 6") TIMBER CRIB 3 TRAIL CONSTRUCTION, REFER TO TRAIL DETAILS
- (SECTION 32 15 51)

 4 EXISTING SLOPE TO BE FILLED AND RETAINED

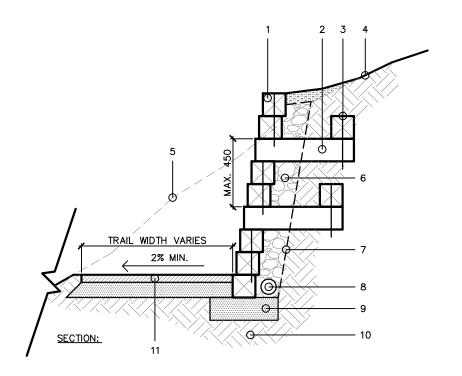
 5 140 X 140mm (6 X 6") TIMBER DEADMAN TIE—BACK

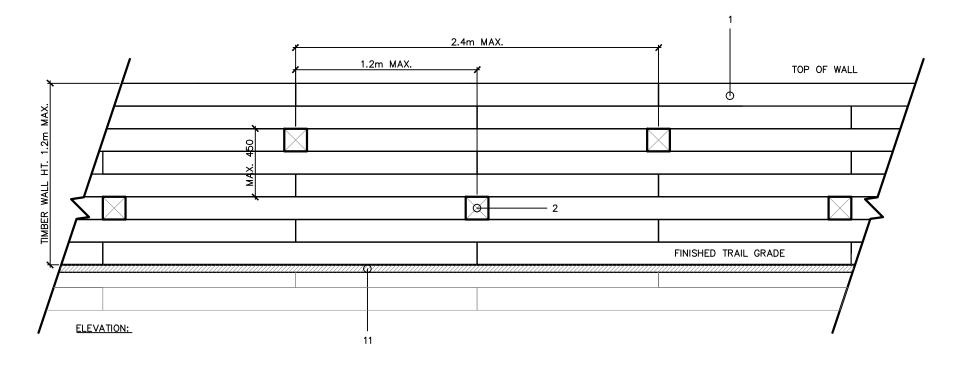
 6 DRAIN ROCK, REFER TO MMCD SPEC.

- 7 STEEL SPIKE CONNECTION 8 NON-WOVEN GEOTEXTILE, REFER TO MMCD SPEC.
- 9 101mmø (4"ø) PERFORATED PIPE, DRAIN TO DAYLIGHT
- 10 GRANULAR BASE (COMPACT TO MMCD SPEC.)
- 11 SUBGRADE (COMPACT TO MMCD SPEC.)
 12 INSERT TIMBER SPACERS AS REQUIRED AT ALL POSTS

LAST REVISED JUL 25/14 32 32 29.01 SCALE 1: 25







- A TIMBER DEADMAN TO EXTEND INTO SUBGRADE A MIN. OF 305mm. B ALL WOOD TIMBER TO BE PRESSURE TREATED
- C WALLS SHALL NOT EXCEED 1220mm (4') IN
 HEIGHT. ANY WALL EXCEEDING 1220mm (4')
 SHALL BE LOWERED TO MAX HEIGHT OR HAVE
 WRITTEN APPROVAL FROM A STRUCTURAL OR
 GEOTECHNICAL ENGINEER.

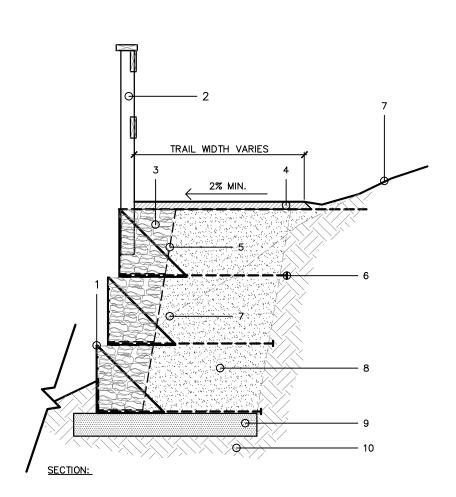
- 1 140 X 140mm (6 X 6") TIMBER CRIB
 2 140 X 140mm (6 X 6") TIMBER DEADMAN TIE—BACK
 3 STEEL SPIKE CONNECTION
 4 EXISTING SLOPE TO BE RETAINED
 5 EXISTING SLOPE TO BE CUT
 6 DRAIN ROCK, REFER TO MMCD SPEC.

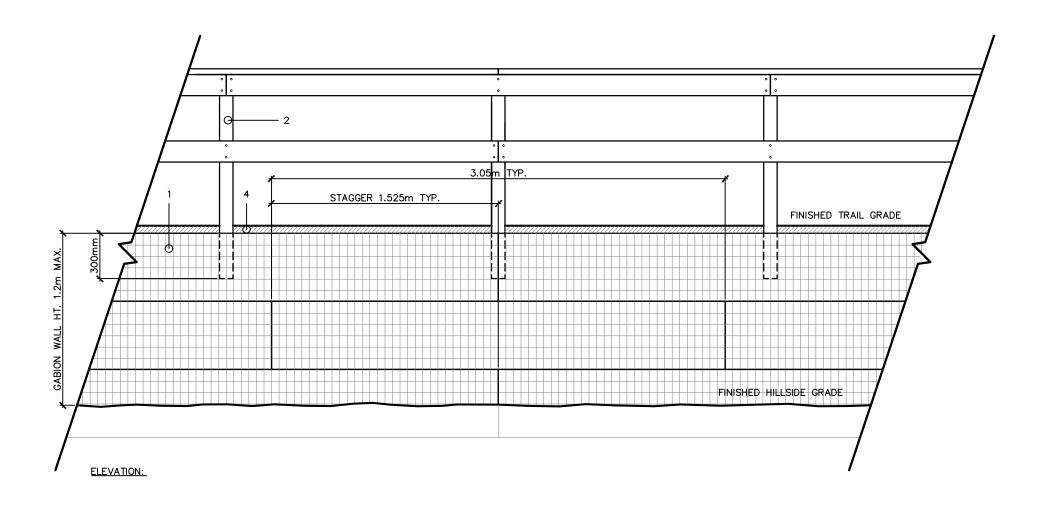
- 7 NON-WOVEN GEOTEXTILE, REFER TO MMCD SPEC.
- 8 101mmø (4"ø) PERFORATED PIPE, DRAIN TO DAYLIGHT 9 GRANULAR BASE (COMPACT TO MMCD SPEC.)
- 10 SUBGRADE (COMPACT TO MMCD SPEC.)
 11 TRAIL CONSTRUCTION, REFER TO TRAIL DETAILS
- (SECTION 32 15 51)

TIMBER RETAINING WALL - CUT SLOPE

LAST REVISED	DRAWING N	10.	
JUL 25/14	70	70	00 00
SCALE	32	32	29.02
1: 25			







- A EXTEND PIN & GEOGRID TO EXISTING SUBGRADE AS PER MANUFACTURERS SPECS.
- B WALLS SHALL NOT EXCEED 1220mm (4') IN HEIGHT.
 ANY WALL EXCEEDING 1220mm (4') SHALL BE
 LOWERED TO MAX HEIGHT OR HAVE WRITTEN APPROVAL
 FROM A STRUCTURAL OR GEOTECHNICAL ENGINEER.
 C TIMBER HANDRAIL REQUIRED WHEN HT. OF RETAINING
 WALL EXCEEDS 610mm (2') UNLESS OTHERWISE NOTED

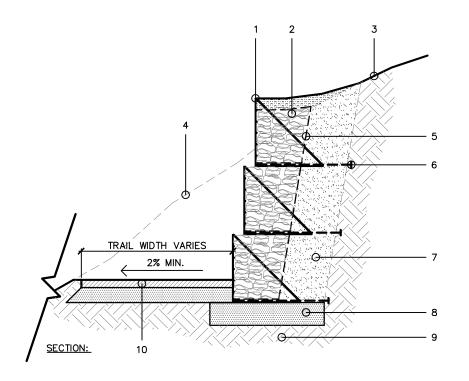
- 1 470 X 457 X 3048mm (18.5" X 18" X 10') 90' WELDED WIRE MESH FORM 2 EMBEDDED TIMBER HANDRAIL, REFER TO

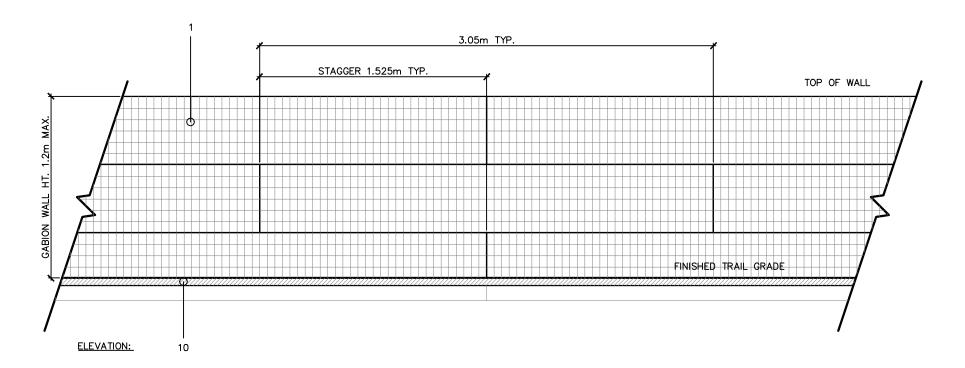
- 2 EMBEDDED TIMBER HANDRAIL, REFER TO DETAIL 32 31 10.09
 3 101 152mmø (4 6"ø) COBBLE ROCK, REFER TO MMCD SPEC.
 4 TRAIL CONSTRUCTION, REFER TO TRAIL DETAILS (SECTION 32 15 51)
- 5 NON-WOVEN GEOTEXTILE, REFER TO MMCD SPEC 6 GEOGRID REINFORCEMENT, REFER TO MMCD SPEC. 7 EXISTING SLOPE TO BE FILLED AND RETAINED

- 8 NATIVE BACKFILL MATERIAL, (COMPACT TO MMCD SPEC.)
 9 GRANULAR BASE (COMPACT TO MMCD SPEC.)
 10 SUBGRADE (COMPACT TO MMCD SPEC)

LAST REVISED JUL 25/14 32 32 36.01 SCALE 1: 25







- A EXTEND PIN & GEOGRID TO EXISTING SUBGRADE AS PER MANUFACTURERS SPECS.
- WANDFACTURERS SPECS.

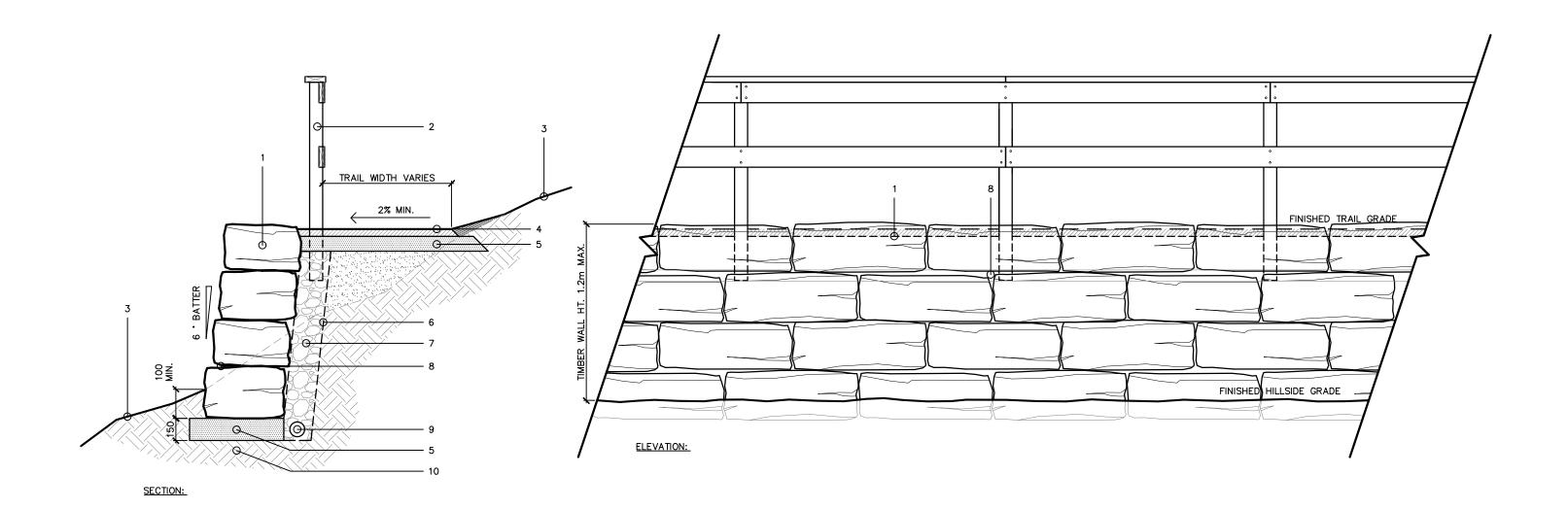
 B WALLS SHALL NOT EXCEED 1220mm (4') IN HEIGHT. ANY
 WALL EXCEEDING 1220mm (4') SHALL BE LOWERED TO
 MAX HEIGHT OR HAVE WRITTEN APPROVAL FROM A
 STRUCTURAL OR GEOTECHNICAL ENGINEER.

- 1 470 X 457 X 3048mm (18.5" X 18" X 10') 90' WELDED WIRE MESH FORM
- 90° WELDED WIRE MESH FORM
 2 101-152mmø (4 X 6ø") COBBLE ROCK
 REFER TO MMCD SPEC.
 3 EXISTING SLOPE TO BE RETAINED
 4 EXISTING SLOPE TO BE CUT
 5 NON-WOVEN GEOTEXTILE, REFER TO MMCD
 SPEC.

- 6 GEOGRID REINFORCEMENT, REFER TO MMCD SPEC. 7 NATIVE BACKFILL MATERIAL, (COMPACT TO MMCD SPEC.)
- 8 GRANULAR BASE (COMPACT TO MMCD SPEC.)
- 9 SUBGRADE (COMPACT TO MMCD SPEC)
 10 TRAIL CONSTRUCTION, REFER TO TRAIL DETAILS
- (SECTION 32 15 51)

LAST REVISED JULY 25/14 SCALE 1: 25





- A ALL BOULDERS SHALL BE QUARRIED AND SOURCED
- LOCALLY. (NO BLAST ROCK WILL BE ACCEPTED)

 B CONTRACTOR TO PROVIDE PROJECT MANAGER WITH
 IMAGES OF THE SELECTED ROCK FOR APPROVAL PRIOR
 TO DELIVERY AND INSTALLATION.
- C WALLS SHALL NOT EXCEED 1220mm (4') IN HEIGHT. ANY WALL EXCEEDING 1220mm (4') SHALL BE LOWERED TO MAX HEIGHT OR HAVE WRITTEN APPROVAL FROM A STRUCTURAL OR GEOTECHNICAL ENGINEER.

 D TIMBER HANDRAIL REQUIRED WHEN HT. OF RETAINING WALL EXCEEDS 610mm (2') UNLESS OTHERWISE NOTED

- 1 DRY STACK BOULDER WALL ROCK SIZE
- (+/- mm) 305H X 610W X 914L mm (12 X 24 X 36")

 EMBEDDED TIMBER HANDRAIL, REFER TO
 DETAIL 32 31 10.09

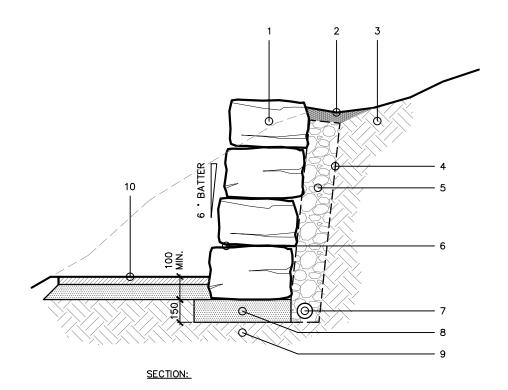
 ADJACENT SOFT SURFACE (REFER TO DWGS.)
- 4 TRAIL CONSTRUCTION, REFER TO TRAIL DETAILS (SECTION 32 15 51)
- 5 GRANULAR BASE (COMPACT TO MMCD SPEC.)

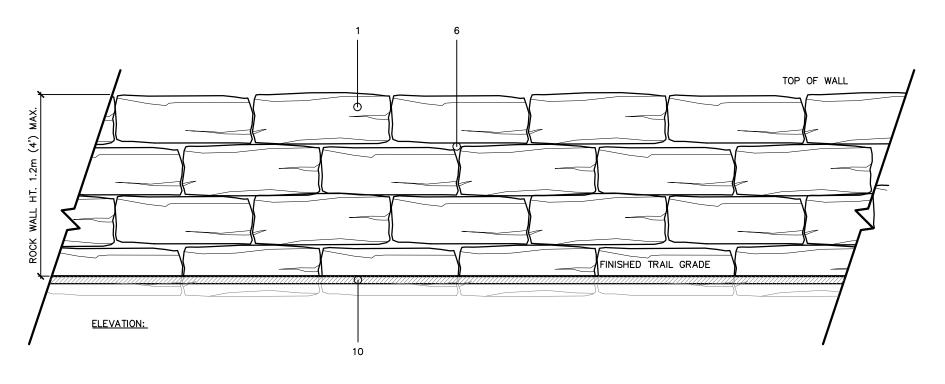
- 6 NON-WOVEN GEOTEXTILE (REFER TO MMCD SPEC.)
 7 DRAIN ROCK (REFER TO MMCD SPEC.)
 8 CHINKING IN ALL LARGE VOIDS
- 9 101mmø (4"ø) HDPE PERF. PIPE
- (DAYLIGHT AT END OF WALL)

 10 SUBGRADE (COMPACT TO MMCD SPEC.)

LAST REVISED AUG 28/15 32 32 53.01 SCALE 1: 25







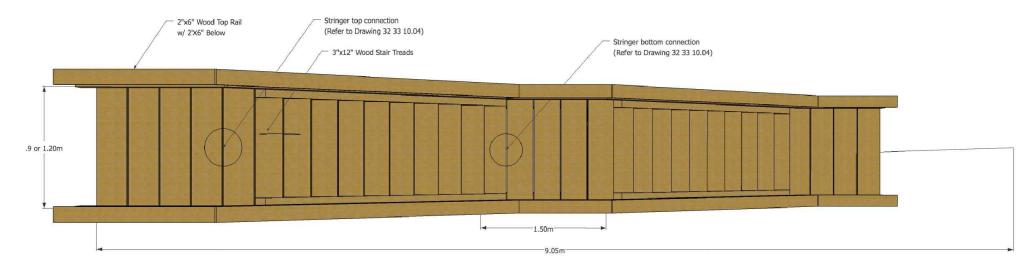
- A ALL BOULDERS SHALL BE QUARRIED AND SOURCED LOCALLY. (NO BLAST ROCK WILL BE ACCEPTED)
 B CONTRACTOR TO PROVIDE PROJECT MANAGER WITH IMAGES OF THE SELECTED ROCK FOR APPROVAL PRIOR TO DELIVERY AND INSTALLATION.
 C WALLS SHALL NOT EXCEED 1220mm (4') IN HEIGHT. ANY WALL EXCEEDING 1220mmM (4') SHALL BE LOWERED TO MAX HEIGHT OR HAVE WRITTEN APPROVAL FROM A STRUCTURAL OR GEOTECHNICAL ENGINEER.

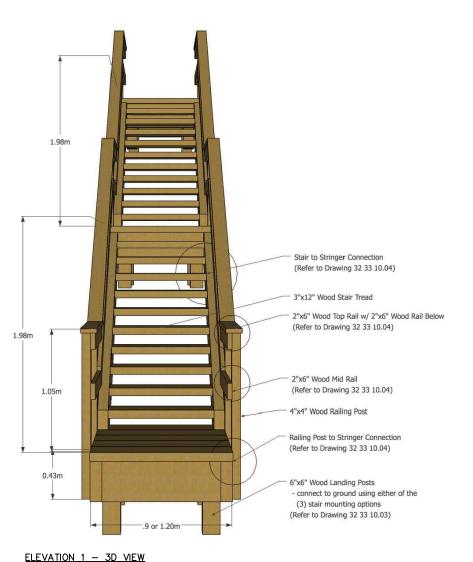
- 1 DRY STACK BOULDER WALL ROCK SIZE (+/- mm) 305H X 610W X 914L mm (12 X 24 X 36")
 2 INSTALL SMALL SWALE AT BACK OF WALL MIN. 101mm DEPTH
- 3 ADJACENT SOFT SURFACE (REFER TO DWGS.) 4 NON-WOVEN GEOTEXTILE (REFER TO MMCD SPEC.)
 5 DRAIN ROCK (REFER TO MMCD SPEC.)

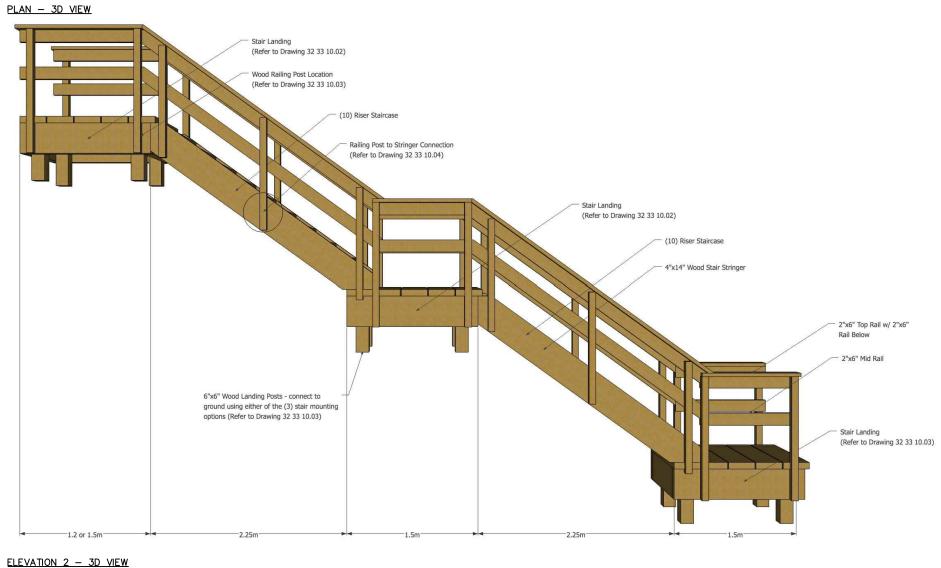
- 6 FILL IN ALL LARGE VOIDS W/ CHINKING 7 101mmø (4"ø) HDPE PERF. PIPE (DAYLIGHT AT END OF WALL)
- 8 GRANULAR BASE (COMPACT TO MMCD SPEC.)
- 9 SUBGRADE (COMPACT TO MMCD SPEC.)
 10 TRAIL CONSTRUCTION, REFER TO TRAIL DETAILS
 (SECTION 32 15 51)

LAST REVISED AUG 28/15 32 32 53.02 SCALE 1: 25









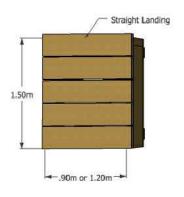
TIMBER STAIRCASE

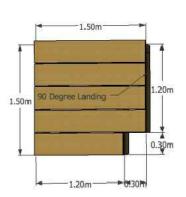
LAST REVISED DRAWING NO

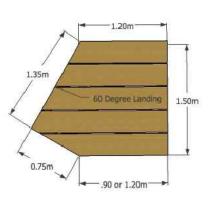
32 33 10.01

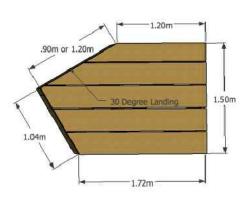
SCALE NTS

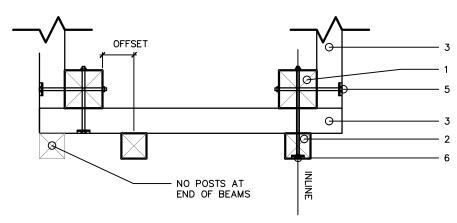










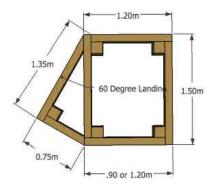


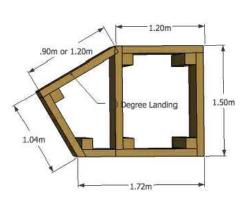
LANDING LAYOUTS 1 - 3D VIEW

Straight Landing 1.50m

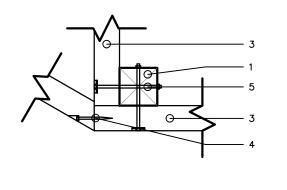
LANDING LAYOUTS 2 - 3D VIEW

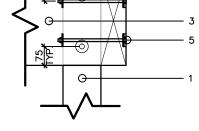
1.50m 1.20m ►0:30m





RAILING POST LOCATIONS SCALE 1:15





ANGLED BEAM CONNECTION SCALE 1:15

30 Degree Landing

3"x12" Decking

But Joint

4"x14" Beam

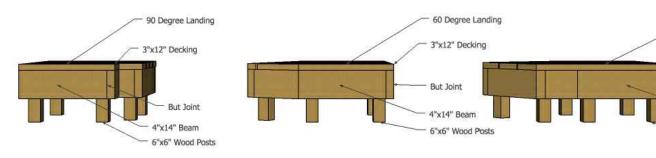
6"x6" Wood Posts

LANDING BEAM TO POST CONNECTION SCALE 1:15

- Straight Landing 3"x12" Decking 4"x14" Beam

6"x6" Wood Posts

LANDING ELEVATIONS - 3D VIEW



- 1 152 X 152mm (6 X 6") WOOD LANDING POST 2 101 X 101mm (4 X 4") WOOD RAILING POST 3 101 X 356mm (4 X 14") WOOD LANDING BEAM

- 4 (2) 8ø X 152mm (% X 6") GRK RSS LAG SCREW (NOT GALVANIZED)
- 5 16ø X 305mm (§ø X 12") MACHINE BOLTS (WASHERS ON BOTH SIDES)
- 6 16ø X 406mm (§ X 16") MACHINE BOLTS (WASHERS ON BOTH SIDES)

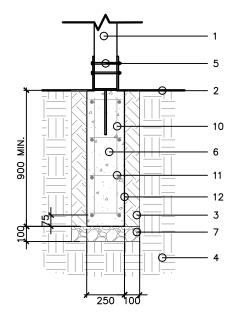
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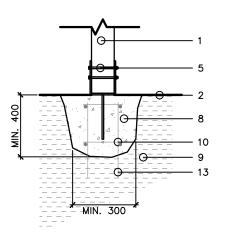
- A ALL FASTENERS TO BE GALVANIZED U.N.O UNLESS OTHERWISE NOTED
- B ALL WOOD TIMBER TO BE FULL DIMENSION ROUGH CUT DOUGLAS FIR-L #2 OR BETTER C ALL WOOD TIMBER COMPONENTS TO BE STAINED
- WITH SIKKENS CETOL 1, COLOUR 'NATURAL 078' D ALL WOOD RAILING POSTS CAN BE LOCATED
- INLINE OR OFFSET FROM 6"X6" WOOD LANDING POSTS. ALL WOOD RAILING POSTS CAN NOT BE LOCATED AT END OF BEAMS
- E ALL VISIBLE/EXPOSED MACHINE BOLTS TO BE COUNTER SUNK INTO WOOD

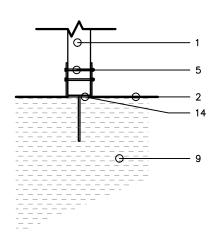
TIMBER STAIR LANDINGS

LAST REVISED	DRAWING N	0.	
OCT 02/14	70	77	10 00
SCALE	32	SS	10.02
AS SHOWN			









CONCRETE FOOTING OPTION

FRACTURED ROCK MOUNT OPTION

SOLID ROCK MOUNT OPTION

- 1 WOOD LANDING POST 2 FINISH GRADE 3 BACKFILL AND COMPACT WITH NATIVE SOIL
- 3 BACKFILL AND COMPACT WITH NATIVE SOIL
 4 UNDISTURBED SUBGRADE
 5 SIMPSON STRONG-TIE CBGT5-6 COLUMN BASE OR APPROVED EQUAL, POWDERCOATED BLACK, CAST INTO CONCRETE FOOTING. INSTALL POSTS WITH §"
 HEX LAG BOLT, NUT, AND WASHER, TWO PER POST. INSTALL WITH EXPOSED PLATES PARALLEL TO TRAIL.
 6 CIP CONCRETE SONO TUBE FOOTING, 25MPa CONCRETE, 4-7% AIR, 70mm SLUMP, CLASS F2
 7 GRANULAR BASE (COMPACT TO MMCD SPEC.)
 8 FRACTURED ROCK CONCRETE FOOTING, 25MPa
- 7 GRANOLAR BASE (COMPACT TO MIND SPEC.)

 8 FRACTURED ROCK CONCRETE FOOTING, 25MPa
 CONCRETE, 4–7% AIR, 70mm SLUMP, CLASS F2, IN
 BEDROCK; BREAK AND REMOVE TOP LAYER OF
 SUBSTRATE TO MIN. 400mm DEPTH OR TO SOLID

- 9 EX. BEDROCK
 10 (6) 10M VERTS EVENLY SPACED
 11 10M TIES @ 254mm O.C.
 12 254mm (10") ø SONO TUBE.
 13 (6) 10M VERTS DRILLED/EPOXIED 150mm
 INTO BEDROCK W/ HILTI HIT HY 200
 14 NON SHRINK GROUT BELOW SADDLE FOR
 UNEVEN BEDROCK

NOTES:

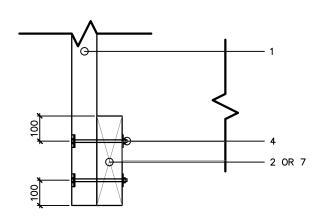
A FOOTING TYPE IS DEPENDENT ON SITE

DRAWING TITLE

TIMBER STAIR BASES

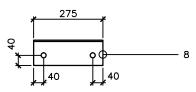
LAST REVISED OCT 02/14 32 33 10.03 SCALE 1: 25

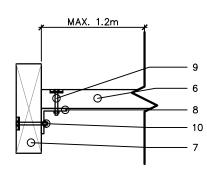




RAILING POST TO BEAM/STRINGER CONNECTION

- 1 102 X 102mm (4 X 4") WOOD RAILING POST 2 102 X 356mm (4 X 14") WOOD LANDING BEAM
- 3 76 X 305mm (3 X 12") WOOD DECKING
- 4 16ø X 254mm (\$ø X 10") MACHINE BOLTS (WASHER ON BOTH SIDES)
- 102 X 102mm (4 X 4") WOOD BEAM FOR STRINGER TOP CONNECTION
- 6 76 X 305mm (3 X 12") WOOD STAIR TREADS
- 7 102 X 356mm (4 X 14") WOOD STAIR STRINGERS
- 102 X 102 X 6mm (4 X 4 X ‡") STEEL ANGLE CUT 275mm (7") LONG PER SIDE OF STAIR TREADS
- 9 (2) 100 X 127mm (30 X 5") MACHINE BOLTS (WASHER ON WOOD SIDE)
- 10 (2) 16 X 152mm (§ X 6") MACHINE BOLTS (WASHER ON WOOD SIDE)
- 11 102 X 102 X 6mm (4 X 4 X 4") STEEL ANGLE CUT 178mm (7") LONG
- 12 (3) 10mmø X 152mm (3ø X 6") GRK RSS LAG SCREWS FROM LANDING BEAM & INTO END OF STRINGERS @ TOP
- 13 51 X 152mm (2 X 6") WOOD TOP & MID RAILS
- 14 6ø X 152mm (¼ø X 4") LAGS





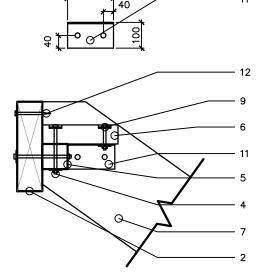
STAIR TO STRINGER CONNECTION

- 15 (3) 9.50 X 152mm (30 X 6") GRK RSS LAG SCREWS FROM DECKING & INTO END OF STRINGERS
- 16 51x51x6mm (2 X 2 X 4") STEEL ANGLE CUT 76mm (3") LONG W/ 38mm (1½") SCREWS 17 76mm (3") SIMPSON STRONG DRIVER TIMBER
- SCREWS @ 610mm 24") O.C.

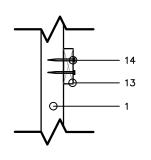
- A ALL FASTENERS TO BE GALVANIZED U.N.O.
- UNLESS OTHERWISE NOTED

 B ALL WOOD TIMBER TO BE FULL DIMENSION ROUGH
 CUT DOUGLAS FIR-L #2 OR BETTER

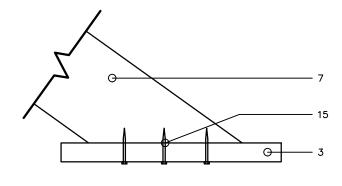
 C ALL WOOD TIMBER COMPONENTS TO BE STAINED
 WITH SIKKENS CETOL 1, COLOUR 'NATURAL 078'
- D ALL HANDRAILS, SIDE RAILS & TOP RAILS SHALL
- BE S4S LUMBER/PLANED ON FOUR (4) SIDES E MITRE & WELD ALL METAL ANGLES PRIOR TO
- GALVANIZATION F ALL VISIBLE/EXPOSED MACHINE BOLTS TO BE COUNTER SUNK INTO WOOD



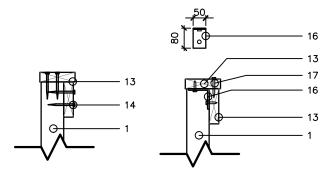
STRINGER TOP CONNECTION



MID RAIL TO POST CONNECTION



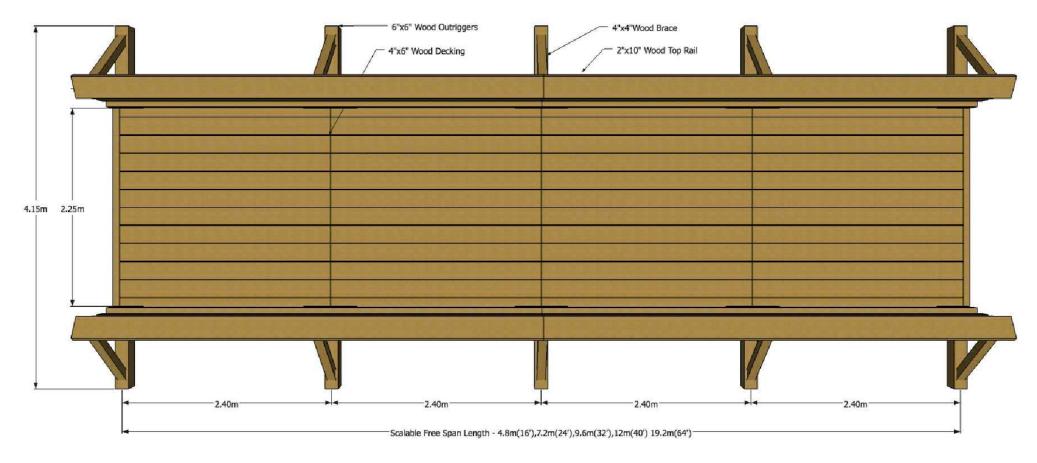
STRINGER BOTTOM CONNECTION



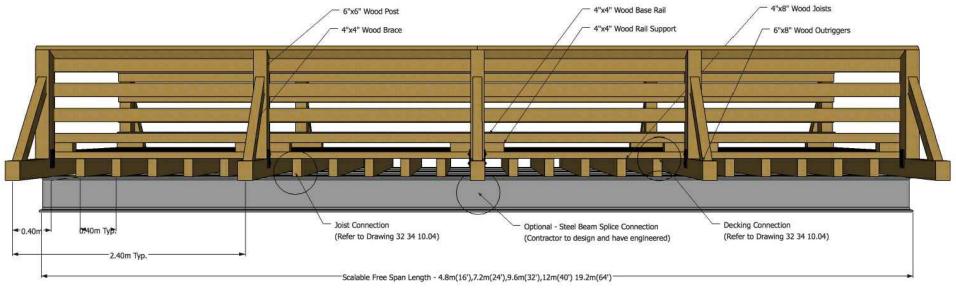
TOP RAIL TO POST CONNECTION

DRAWING TITLE





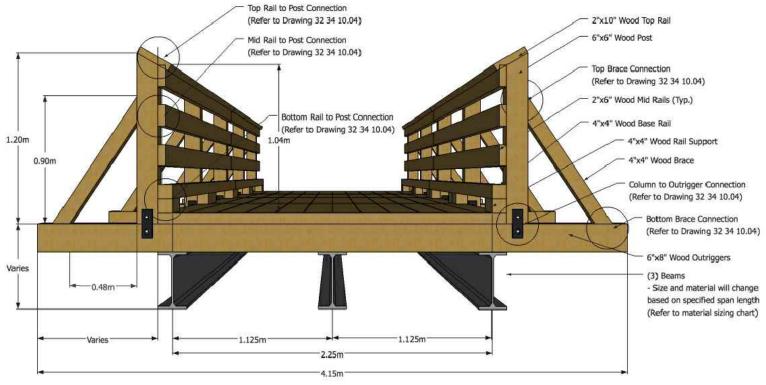
SCALABLE FREE SPAN BRIDGE PLAN - 3D VIEW



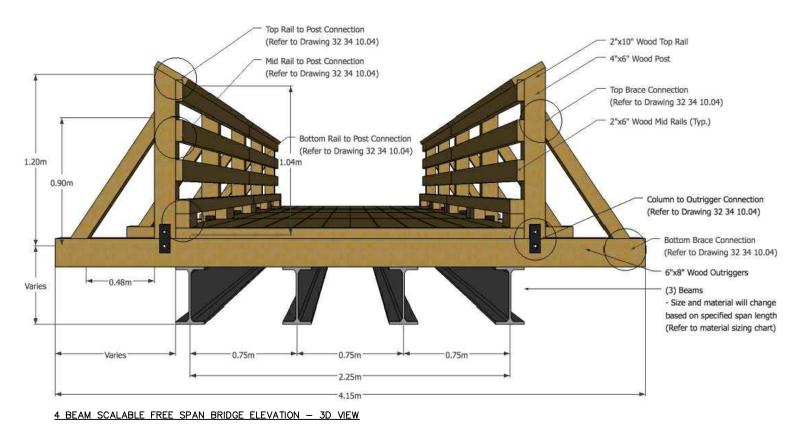
SCALABLE FREE SPAN BRIDGE ELEVATION - 3D VIEW

DRAWING TITLE





3 BEAM SCALABLE FREE SPAN BRIDGE ELEVATION - 3D VIEW



TIMBER/GLULAM BEAM SIZING CHART

	3 BEAM SPAN	4 BEAM SPAN
4.8m	8x16 D.FIR-L TIMBER	8x12 D.FIR-L TIMBER
	80x532 GLULAM-E, D.FIR-L, 24F-E	80x456 GLULAM-E, D.FIR-L, 24F-E
	130x456 GLULAM-E, D.FIR-L, 24F-E	130x380 GLULAM-E, D.FIR-L, 24F-E
7.2m	175x418 GLULAM-E, D.FIR-L, 24F-E	175x342 GLULAM-E, D.FIR-L, 24F-E
	215x380 GLULAM-E, D.FIR-L, 24F-E	
	265x342 GLULAM-E, D.FIR-L, 24F-E	
	130x608 GLULAM-E, D.FIR-L, 24F-E	130x532 GLULAM-E, D.FIR-L, 24F-E
	175x532 GLULAM-E, D.FIR-L, 24F-E	175x456 GLULAM-E, D.FIR-L, 24F-E
9.6m	215x494 GLULAM-E, D.FIR-L, 24F-E	265x418 GLULAM-E, D.FIR-L, 24F-E
	265x456 GLULAM-E, D.FIR-L, 24F-E	315x380 GLULAM-E, D.FIR-L, 24F-E
	365x418 GLULAM-E, D.FIR-L, 24F-E	
	130x722 GLULAM-E, D.FIR-L, 24F-E	130x646 GLULAM-E, D.FIR-L, 24F-E
	175x684 GLULAM-E, D.FIR-L, 24F-E	175x570 GLULAM-E, D.FIR-L, 24F-E
12m	215x608 GLULAM-E, D.FIR-L, 24F-E	215x532 GLULAM-E, D.FIR-L, 24F-E
	265x570 GLULAM-E, D.FIR-L, 24F-E	315x494 GLULAM-E, D.FIR-L, 24F-E
	365x532 GLULAM-E, D.FIR-L, 24F-E	365x456 GLULAM-E, D.FIR-L, 24F-E
	175x1102 GLULAM-E, D.FIR-L, 24F-E	175x950 GLULAM-E, D.FIR-L, 24F-E
	215x1026 GLULAM-E, D.FIR-L, 24F-E	215x912 GLULAM-E, D.FIR-L, 24F-E
20m	265x950 GLULAM-E, D.FIR-L, 24F-E	265x836 GLULAM-E, D.FIR-L, 24F-E
	315×912 GLULAM-E, D.FIR-L, 24F-E	315×798 GLULAM-E, D.FIR-L, 24F-E
	365x874 GLULAM-E, D.FIR-L, 24F-E	365x760 GLULAM-E, D.FIR-L, 24F-E

STEEL BEAM SIZING CHART

	3 BEAM SPAN	4 BEAM SPAN		
	W310x31	W310x24		
7 0	W250x45	W250x33		
7.2m	W250x49	W200x46		
	W200x71			
	W410x46	W360×39		
9.6m	W360x57	W310x45		
	W310x74	W250x67		
	W250x101			
	W530×66	W460x52		
12m	W460x74	W410x60		
	W410x85 (BRIDGE 1)	W360x72		
	W760x134	W610x125		
20m	W690x152	W530x150		
	W610x174 (BRIDGE 2)	W460×177		

DRAWING TITLE

LAST REVISED DRAWING NO.

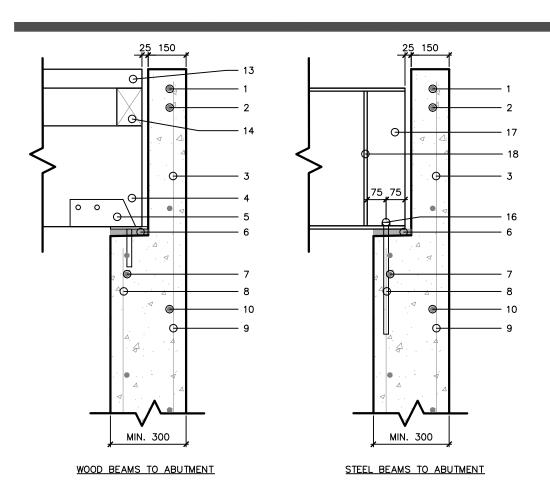
OCT 02/14

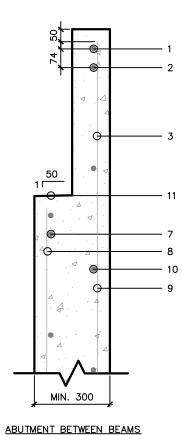
SCALE NTS

DRAWING NO.

32 34 10.02







0 VARIES WITH BEAM SIZE ABUTMENT PLAN VIEW 150 GRADE

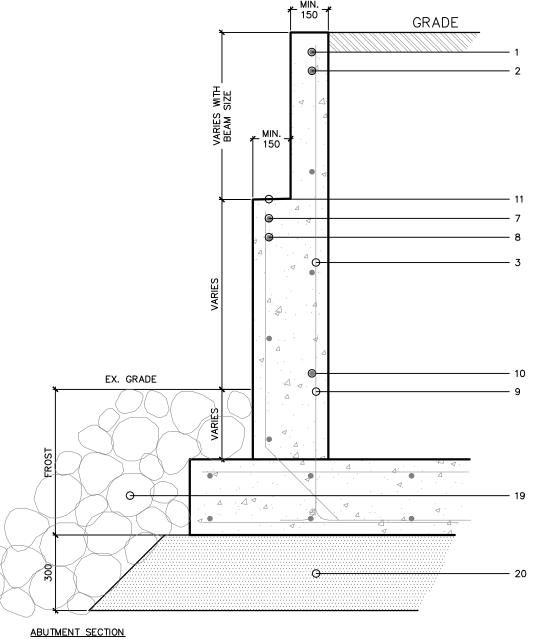
- 1 (2) 15M HORIZONTAL REBAR © TOP OF WALL 2 15M HORIZONTAL REBAR © 406mm (16") O.C.
- 3 15M VERTICAL REBAR @ 305mm (12") O.C.
- 4 MIN. 203 X 300mm (8 X 12") WOOD BEAM 5 SIMPSON STRONG TIE HGLBB BEAM SEAT OR CUSTOM BUILT
- 25mm (1") NON-SHRINK GROUT PAD
- 15M HORIZONTAL REBAR @ 406mm (16") O.C.
- 8 15M VERTICAL REBAR @ 406mm (16") O.C. VERTICAL REBAR, REFER TO RETAINING WALL

- 9 VERTICAL REBAR, REFER TO RETAINING WALL SCHEDULE
 10 HORIZONTAL REBAR, REFER SIZING SCHEDULE
 11 SLOPE SEAT BELOW BEAMS
 12 REFER TO ABUTMENT SECTION
 13 76 X 152mm (3 X 6") WOOD DECKING
 14 101 X 203mm (4 X 8") WOOD JOISTS @ 457mm (18") O.C.
- 15 ABUTMENT
- 16 (2) 19ø X 432mm ($\frac{3}{4}$ ø X 17") ANCHOR BOLT

- 17 STEEL BEAM PER SCHEDULE
- 18 12.5mm $\binom{1"}{2}$ THICK STEEL STIFFENERS EACH SIDE
- 19 SCOUR PROTECTION (REFER TO GEOTECH. REPORT)
 20 CRUSHED BASE COURSE (REFER TO GEOTECH.
- REPORT)

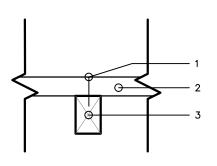
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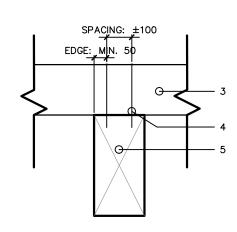
- A ALL CONNECTORS/PLATES TO BE HOT DIPPED GALVANIZED, U.N.O. UNLESS OTHERWISE NOTED
- B ALL WOOD TIMBER TO BE ROUGH CUT DOUGLAS FIR-L #2 OR BETTER
- C ALL WOOD MEMBERS EXPOSED TO GROUND CONTACT OR WHERE WATER ACCUMULATES SHALL BE ACQ TREATED
- D ALL WOOD TIMBER COMPONENTS TO BE STAINED WITH SIKKENS CETOL, COLOUR NATURAL 078

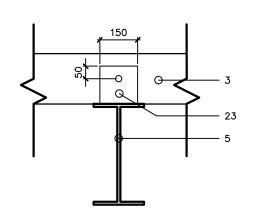


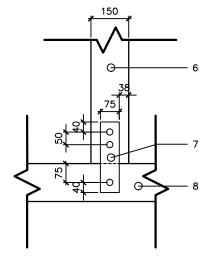
LAST REVISED OCT 02/14 32 34 10.03 SCALE 1:15

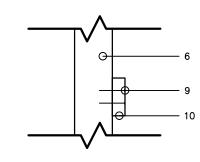












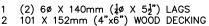
DECKING CONNECTION

JOIST CONNECTION (WOOD BEAM)

JOIST CONNECTION (STEEL BEAM)

COLUMN TO OUTRIGGER CONNECTION

MID RAIL TO POST CONNECTION



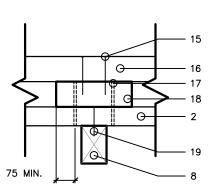
- 3 101 X 203mm (4"x8") WOOD JOISTS @ 406mm (16") O.C.
- 4 (2) 6ø X 305mm (‡ø X 12") LAGS OR (2) 6 X 305mm (# X 12") GRK FASTENERS
- 5 BEAM (REFER TO SCHEDULE)
- 6 101 X 152mm (4 X 6") WOOD POST
- 7 6 X 76 X 280mm (½ X 3 X 11") SADDLE 8 152 X 203mm (6 X 8") WOOD OUTRIGGER
- 9 (2) 6ø X 101mm (4ø X 4") LAGS PER COLUMN 10 51 X 152mm (2 X 6") WOOD MID RAILS
- 11 (2) 38mm $(1\frac{1}{2})$ SCREWS
- 12 4.7mm ($\frac{3}{16}$ ") STEEL ANGLE @ 305mm (12") O.C. 13 51 X 152mm (2 X 6") WOOD TOP-MID RAIL, TIGHT
- TO TOP RAIL
- 14 51 X 254mm (2 X 10") WOOD TOP RAIL
- 15 (2) 9.5¢ X 152mm (8¢ X 6") LAGS 16 101 X 101mm (4 X 4") WOOD BASE RAIL
- 17 (2) 9.50 X 178mm (30 X 7") MACHINE BOLTS THROUGH STANDOFF & DECKING

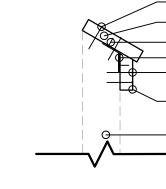
- 18 101 X 101 X 305mm (4 X 4 X 12") WOOD BASE RAIL
- STANDOFF

 19 TYPICAL DECKING CONNECTION
- 20 (1) 19mmø (3/4) MACHINE BOLT CENTERED IN CONNECTION
- 21 101 X 101mm (4 X 4") WOOD BRACE 22 152 X 203mm (6 X 8") WOOD OUTRIGGERS @ BRACES
- 23 127 X 152mm (5 X 6") STEEL TIE CLIP WELDED TO STEEL BEAMS AT 406mm (16") O.C

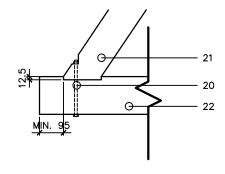
NOTES:

- A ALL CONNECTORS/PLATES TO BE HOT DIPPED GALVANIZED, UNLESS OTHERWISE NOTED
- B ALL WOOD TIMBER TO BE ROUGH CUT DOUGLAS FIR-L #2 OR BETTER
- C ALL WOOD TOP & MID RAILS SHALL BE S4S LUMBER/PLANED ON FOUR (4) SIDES
- D ALL WOOD MEMBERS EXPOSED TO GROUND CONTACT OR WHERE WATER ACCUMULATES SHALL BE ACQ TREATED
- E ALL WOOD TIMBER COMPONENTS TO BE STAINED WITH SIKKENS CETOL, COLOUR NATURAL 078





BOTTOM RAIL TO POST CONNECTION



TOP RAIL TO POST CONNECTION

150

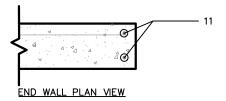
BOTTOM BRACE CONNECTION

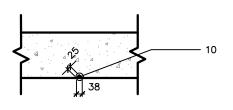
TOP BRACE CONNECTION

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CRACK CONTROL JOINT

- (2) CONT. "Lb" BAR Ø AT T/O WALL VERTICAL "M" BARS
- HORIZONTAL "Lw" BARS "O" BAR DOWEL OUT OF FOOTING
- "Lb" BAR
- 5a (3) BARS OF Lb BAR Ø BELOW DOWELS 6 "D" BARS 7 "P" BARS

- FOUNDATION DRAIN BY OTHERS
- APPROVED BEARING MATERIAL 10 CRACK INDUCING CONTRACTION JOINT EVERY 5.6m (18'-6") O.C., UNLESS OTHERWISE NOTED

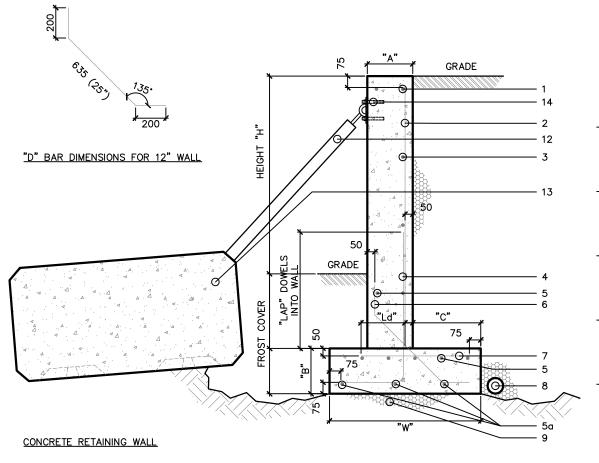
 11 (2)-"M" VERTICAL BARS © ENDS OF WALL

 12 76mmø (3"ø) STEEL BRACE © 1.8m (6')
- O.C. REQUIRÉD IF THE RETAINING WALL IS BACKFILLED PRIOR TO 28 DAYS AFTER POURING OR CONCRETE REACHES 3600 PSI (25 MPa).

- 13 LOCK BLOCK @ 1.8m (6') O.C. REQUIRED IF RETAINING ALL IS BACKFILLED PRIOR TO 28 DAYS AFTER POURING.
- 14 18mmø (¾"ø) HILTI BOLTS

NOTES:

- A FOR WALL HEIGHTS LESS THAN 10'-0" TALL, DOWELS CAN BE SPLICED AT BOTTOM OF WALL. DOWELS INTO STEM MUST BE: 24" FOR 10M AND 35" FOR 15M
- B IF TOE OF FOOTING IS NOT LONG ENOUGH FOR "Ld", THEN HOOK "P" BARS FACE DOWN OF FOOTING OR J-HOOK BARS AS REQUIRED FOR "Ld" LENGTH.
- C SITE EXCAVATION MUST CONFORM WITH "WCB"
 REGULATIONS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SITE EXCAVATION, AS WELL AS ANY TRENCH OR SLOPE SHORING.

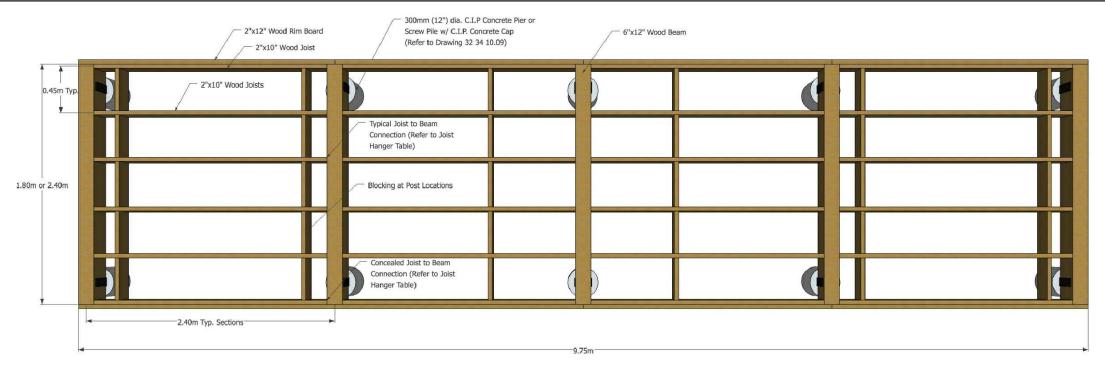


STRUCTURAL SIZING CHART

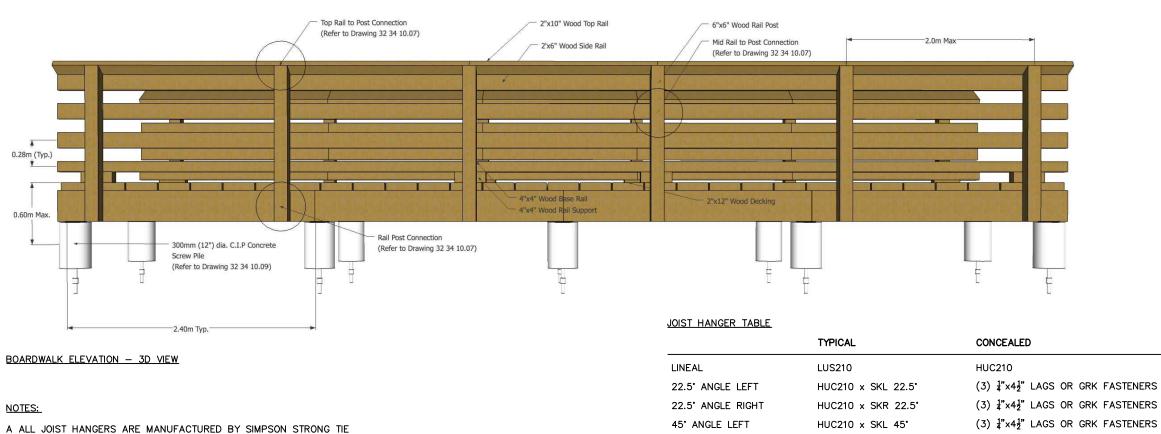
HEIGHT	"A"	"B"	"C"	"W"	"O" BARS	"LAP"	"M" BARS	"D" BARS	"Lw" BARS	"P" BARS	"Lb" BARS	"Ld"
3'-0"	12"	12"	0'-8"	1'-10"	15M @ 20"O.C.	2'-9"	NONE	15M@20"O.C.	15M@18"O.C.	15M@13"O.C.	5-10M	18"
4'-0"	12"	12"	1'-0"	2'-4"	15M@20"O.C.	3'-9"	NONE	15M@20"O.C.	15M@18"O.C.	15M@13"O.C.	4-15M	26"
5'-0"	12"	12"	1'-4"	2'-9"	15M@20"O.C.	4'-9"	NONE	15M@20"O.C.	15M@18"O.C.	15M@13"O.C.	4-15M	26"
6'-0"	12"	12"	1'-8"	3'-3"	15M@20"O.C.	5'-9"	NONE	15M@20"O.C.	15M@18"O.C.	15M@13"O.C.	4-15M	26"
7'-0"	12"	12"	1'-11"	3'-8"	15M @ 20"O.C.	6'-9"	NONE	15M@20"O.C.	15M@18"O.C.	15M@13"O.C.	4-15M	26"
8'-0"	12"	12"	1'-10"	4'-1"	15M@14"O.C.	7'-9"	NONE	15M@14"O.C.	15M@12"O.C.	15M@14"O.C.	5-15M	26"
9'-0"	12"	12"	2'-2"	4'-7"	15M@14"O.C.	8'-9"	NONE	15M@14"O.C.	15M@12"O.C.	15M@14"O.C.	5-15M	26"
10'-0"	12"	12"	2'-7"	5'-1"	15M@14"O.C.	9'-9"	NONE	15M@14"O.C.	15M@12"O.C.	15M@14"O.C.	5-15M	26"
11'-0"	12"	12"	3'-1"	5'-9"	15M @ 9"O.C.	2'-2"	15M@14"O.C.	15M@14"O.C.	15M@12"O.C.	15M@14"O.C.	5-15M	26"
12'-0"	12"	12"	3'-7"	6'-5"	15M @ 9"O.C.	2'-2"	15M@14"O.C.	15M@14"O.C.	15M@12"O.C.	15M@14"O.C.	5-15M	26"
13'-0"	12"	12"	4'-1"	7'-1"	20M@9"O.C.	2'-6"	15M@14"O.C.	15M@14"O.C.	15M@12"O.C.	15M@9"O.C.	6-15M	26"
14'-0"	12"	12"	4'-8"	7'-10"	20M@7"O.C.	2'-6"	15M@14"O.C.	15M@14"O.C.	15M@12"O.C.	15M@9"O.C.	6-15M	30"
15'-0"	13"	13"	5'-0"	8'-4"	20M@7"O.C.	2'-6"	15M@9"O.C.	15M@14"O.C.	20M@12"O.C.	20M@9"O.C.	6-20M	30"
16'-0"	14"	14"	5'-4"	8'-11"	25M@9"O.C.	2'-11"	15M@9"O.C.	15M@14"O.C.	20M@12"O.C.	20M@9"O.C.	6-20M	30"
17'-0"	16"	16"	5'-6"	9'-5"	25M@9"O.C.	2'-11"	15M@9"O.C.	15M@9"O.C.	25M@18"O.C.	20M@9"O.C.	5-25M	50"
18'-0"	17"	17"	5'-10"	10'-0"	25M@9"O.C.	2'-11"	15M@9"O.C.	15M @ 9"O.C.	25M@18"O.C.	20M@9"O.C.	5-25M	50"
19'-0"	18"	18"	6'-2"	10'-7"	25M@9"O.C.	2'-11"	15M@9"O.C.	15M@9"O.C.	25M@17"O.C.	25M@11"O.C.	6-25M	50"
20'-0"	19"	19"	6'-7"	11'-2"	30М@9"О.С.	3'-8"	15M@9"O.C.	15M@9"O.C.	25M@16"O.C.	25M@11"O.C.	6-25M	50"
21'-0"	20"	20"	6'-11"	11'-9"	30M@9"O.C.	3'-8"	20M@9"O.C.	20M@9"O.C.	25M@15"O.C.	25M@11"O.C.	7-25M	50"
22'-0"	22"	22"	7'-1"	12'-3"	30M@9"O.C.	3'-8"	20M@9"O.C.	20M@9"O.C.	25M@14"O.C.	25M@11"O.C.	7-25M	50"

DRAWING TITLE





BOARDWALK PLAN - 3D VIEW



45° ANGLE RIGHT

HUC210 x SKR 45°

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LAST REVISED AUG 15/14
SCALE NTS

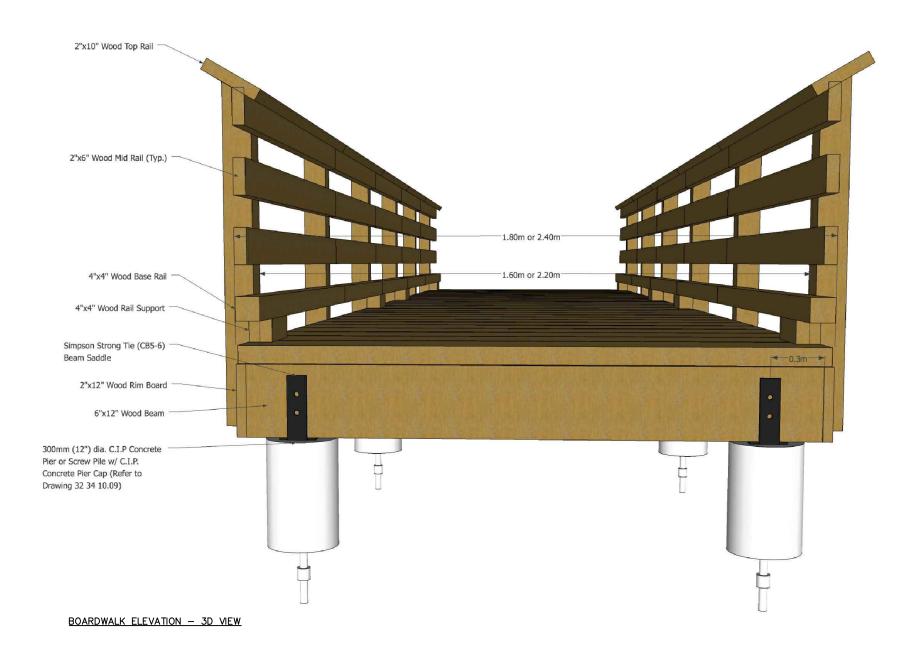
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(3) 4"x41" LAGS OR GRK FASTENERS

SUPPLEMENTARY DETAIL DRAWINGS





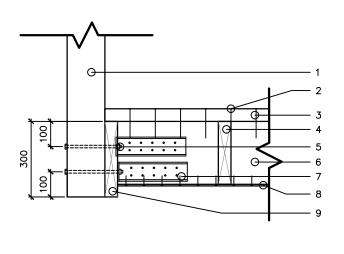
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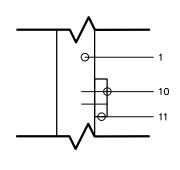
WETLAND BOARDWALK - 2 OF 2

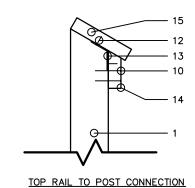
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RAIL POST CONNECTION

- MID RAILS TO POST CONNECTION
- 1 152 X 152mm (6 X 6") WOOD RAIL POSTS @ MAX. 2m O.C.
- 2 76mm (3") DECK SCREWS INTO BLOCKING @ 102mm (4") 0.C. (OR CS16 STRAP)
- 3 51 X 305mm (2 X 12") WOOD DECKING 4 51 X 254mm (2 X 10") WOOD JOISTS @ 457mm (18") 0.C.
- 5 16mm (§"ø) MACHINE BOLTS
 6 51 X 254mm (2"x10") WOOD BLOCKING BETWEEN RIM BOARDS
 © POST LOCATIONS
- 7 HDUA SIMPSON HOLD DOWN 8 SIMPSON CS16 SOIL STRAP CUT BETWEEN RIMBOARDS, 8d
- 9 51 X 305mm (2 X 12") WOOD RIM BOARD
- 10 (2) 6ø X 102mm (‡ø X 4") LAGS 11 51 X 152mm (2 X 6") WOOD MID RAILS

- 12 (2) 38mm (1½") SCREWS 13 4.7mm (½") STEEL ANGLE @ 305mm (12") O.C. 14 51 X 152mm (2 X 6") WOOD TOP-MID RAIL,
- TIGHT TO TOP RAIL
- 15 51 X 254mm (2 X 10") WOOD TOP RAIL

NOTES:

- A ALL FASTENERS TO BE GALVANIZED U.N.O UNLESS
 OTHERWISE NOTED
 B ALL WOOD TIMBER TO BE ROUGH CUT DOUGLAS FIR-L #2
 OR BETTER
 C ALL WOOD TOP & MID RAILS SHALL BE S4S
 LUMBER/PLANED ON FOUR (4) SIDES
 C ALL WOOD TIMBER COMPONENTS TO BE STAINED WITH
 SIKKENS CETOL COLOUR NATURAL 078
- SIKKENS CETOL, COLOUR NATURAL 078

DRAWING TITLE

LAST REVISED AUG 15/14 32 34 10.08 SCALE 1:15



- 151 X 305mm (6 X 12") WOOD BEAM
 (2) 16mmø (§"ø) MACHINE BOLTS
 CB5-6 SIMPSON COLUMN BASE
 REINFORCED PIER CAP
 10M VERTS EVENLY SPACED

- 10M VERTS EVENLT SFACED
 10M CIRCULAR CLOSED TIES © 254mm (10") O.C.
 SS5 CHANCE HELICAL STANDARD PIER CAP
 19Ø X 76mm (¾ X 3") COUPLING BOLT
 SS5 CHANCE HELICAL PIER & ANCHOR

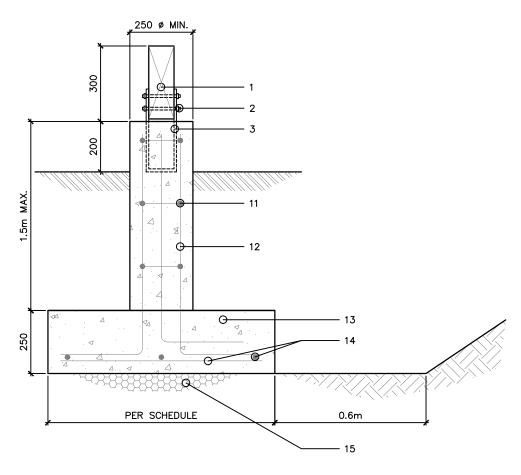
- 10 305mmø (12"ø) CONCRETE PILE 11 10M TIES @ 254mm (10") O.C.

- 6-10M DOWELS CONCRETE PAD
- 12 13 14 15
- 15M @ 305mm (12") O.C. E/W APPROVED BEARING MATERIAL

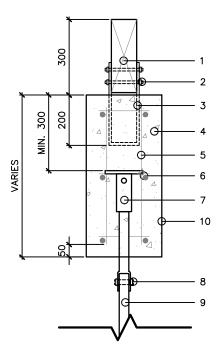
A BEARING MATERIAL MUST BE DETERMINED BY A PROFESSIONAL GEOTECHNICAL ENGINEER REGISTERED IN THE PROVINCE OF BC.

PAD SCHEDULE

ALLOWABLE BEARING PRESSURE; kPg (PSF)	PAD DIMENSIONS; mm (ft)
35 (<750)	REFER TO SCREW PILE
35 (750)	900x900 (3'0"x3'0")
60 (1250)	600x600 (2'0"x2'0")
300 (6350)	NO PAD



CONCRETE PIER SECTION



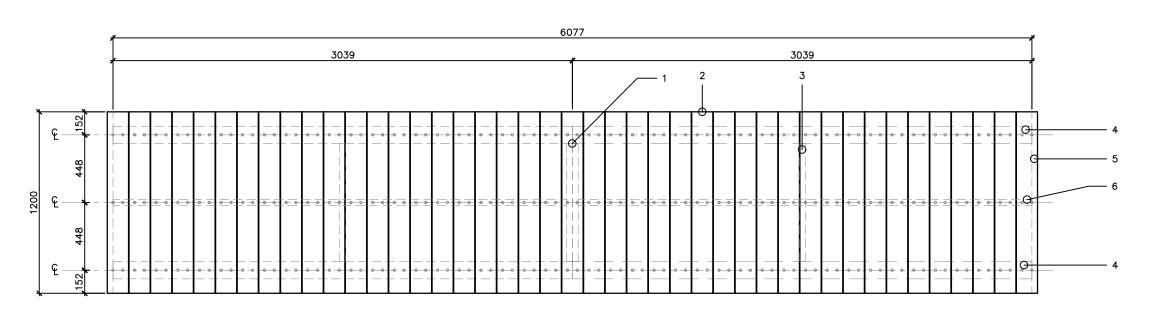
300

CONCRETE PILE SECTION

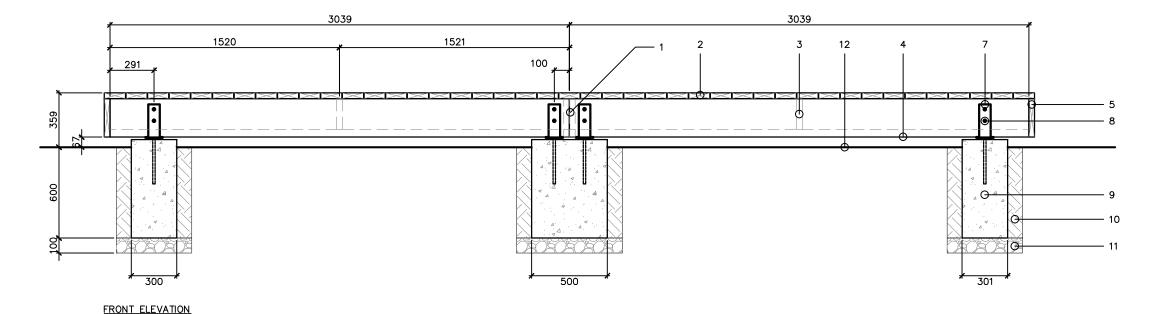
TYP. CIP CONCRETE PILE OR PIER CAP PLAN

DRAWING TITLE





<u>PLAN</u>



NOTES:

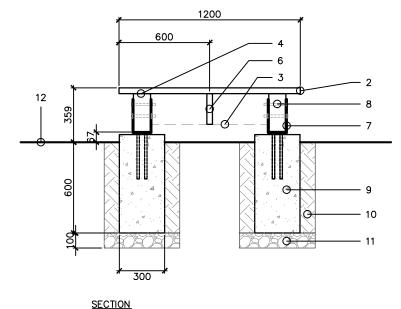
- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER
- C COUNTERSINK ALL BOLTS/SCREWS TO THE SPECIFIED WASHER SIZE AND TO ENSURE THE HEADS DO NOT EXTEND BEYOND SURFACE OF THE
- D ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR E ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF SIKKENS CETOL 1, COLOUR 'NATURAL 078'
- 1 (2) 38 X 184mm (2 X 8") WOOD JOISTS, ATTACH TO BEAMS WITH SIMPSON STRONG TIE LUS210 JOIST HANGERS OR APPROVED EQUAL
- 2 38 X 140mm (2 X 6") WOOD DECKING, ATTACH DECKING TO BEAMS
- WITH 6 X 76mm (1 X 3") LAG SCREW ASSEMBLIES
- 38 X 184mm (2 X 8") WOOD JOISTS, ATTACH TO BEAMS WITH LUS210 JOIST HANGERS
- 4 114 X 254mm (4½ X 10") ROUGH SAWN DOUGLAS FIR BEAMS 5 38 X 191mm (2"X10") ROUGH SAWN DOUGLAS FIR END WOOD JOISTS, ATTACH TO ENDS OF BEAMS WITH 6 X 64mm (1 X41 LAG SCREW ASSEMBLIES
- 38 X 203mm (2 X 8") ROUGH SAWN DOUGLAS FIR BEAM, ATTACH TO JOISTS WITH LÙS210 JOIST HANGERS
- SIMPSON STRONG TIE CBGT5-4.5 COLUMN BASE BRACKET.
- 8 ATTACH BRACKET TO BEAM WITH (2) 16 X 127mm (§ X 5") LENGTH HEX BOLT ASSEMBLIES, DRILL AND EPOXY REBAR ANCHORS INTO CONCRETE

 9 C.I.P. CONCRETE FOOTING

 10 BACKFILL AND COMPACT WITH NATIVE SOIL

 11 GRANULAR BASE (COMPACT TO MMCD SPEC.)

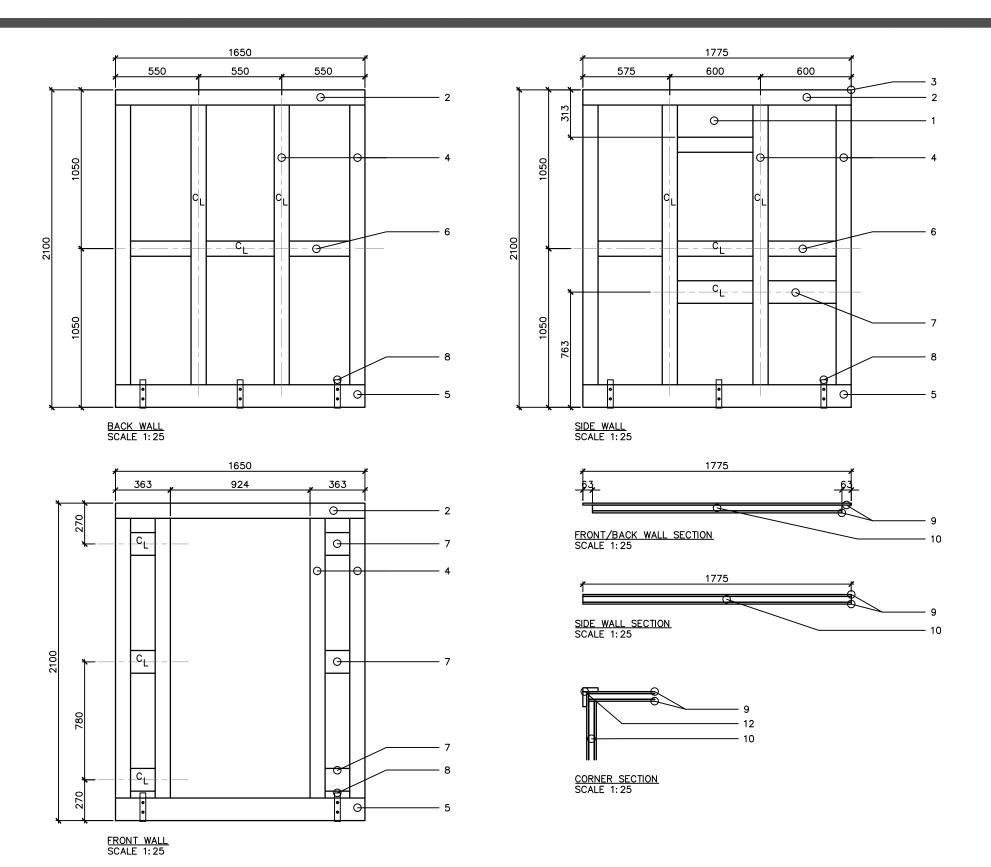
- 12 FINISHED GRADE



TRAIL BOARDWALK

LAST REVISED AUG 28/14 32 34 10.10 SCALE 1: 25





- SCREEN VENT OPENING 38 X 89mm (2 X 4") WOOD TOP PLATE
- BACK CORNER
- 38 X 89mm (2 X 4") WOOD STUD 38 X 140mm (2 x 6") WOOD BOTTOM PLATE 38 X 89mm (2 X 4") WOOD CROSS STUD
- 38 X 140mm (2 x 6") WOOD CROSS STUD ATTACH WOOD BOTTOM PLATE TO CONCRETE PAD USING STEEL FLOOR BRACKETS WITH (2) 16 X 150mm (§ X 6") HEX BOLT ASSEMBLIES
- 9 13mm (1") GIS SHEATING INTERIOR & EXTERIOR RUNNING HORIZONTAL
 10 FRAMING (FRONT/BACK/SIDE WALL)
- 11 13mm (J") GIS SHEATING INTERIOR & EXTERIOR RUNNING HORIZONTAL
 12 19 X 89mm (1 X 4") CORNER MOLDING

- A ALL WOOD FOR FRAMING TO BE CONSTRUCTION STANDARD S-P-F OR BETTER B ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL C HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER AND NUT.

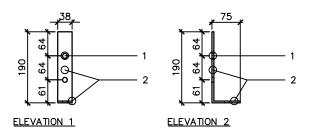


- 1 16mm (§") HOLE FOR HEX BOLT ASSEMBLY
- 2 4mm (3") STANDARD STEEL PLATE

NOTES:

PLAN VIEW

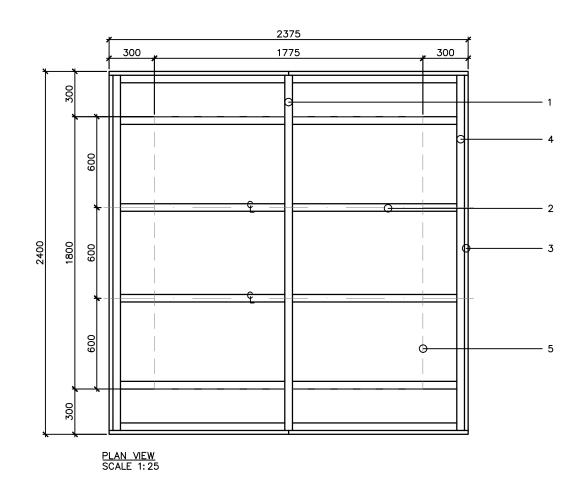
- A ALL WELDS SHALL BE CONTINUOUS, CLEAN AND ALL BURRS TO BE REMOVED PRIOR TO PAINTING AND/OR POWDER COATING
- B ALL METAL COMPONENTS SHALL BE POWDER COATED (RAL 9005, "JET BLACK") OR APPROVED EQUAL



FLOOR BRACKET SCALE 1:10

LAST REVISED AUG 28/15 32 36 10.01 COMFORT STATION - STRUCTURE SCALE 1: 25





- A ALL WOOD FOR FRAMING TO BE CONSTRUCTION STANDARD S-P-F OR BETTER B SIZE OF NAILS FOR FRAMING IS DEPENDANT ON CONSTRUCTION DETAIL (SEE BC BUILDING CODE FOR SIZING AND SPACING)
- C ALL COMFORT STATION HARDWARE TO BE AS FOLLOWS:

 TANKS: (1) 750 GALLON TANK BOTTOM NO INLET OR OUTLET

 (1) BC PARKS B-1-2 "DISABLED" SLAB LID

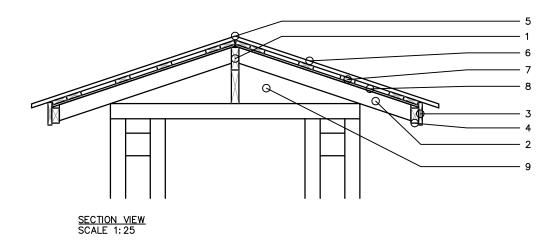
 KON KAST PRODUCTS 250-765-1423

 TOILET STEM: (1) OUTHOUSE TOILET STEM (HANDICAP)
- - TRUE FORM FIBERGLASS LTD. 250-545-5007

- 1 38 X 140mm (2 X 6") RIDGE 2 38 X 89mm (2 X 4") RAFTER

- 3 19 X 140mm (1 X 6") FASCIA 4 38 X 89mm (2 X 4") SUB-FASCIA 5 EXTENT OF OUTSIDE WALLS 6 METAL ROOF

- 7 19 X 89mm (1 X 4") STRAPPING
- 8 13mm (½") STANDARD PLY
 9 13mm (½") PLY GABLE END —
 MATCH W/ FRONT/BACK WALL



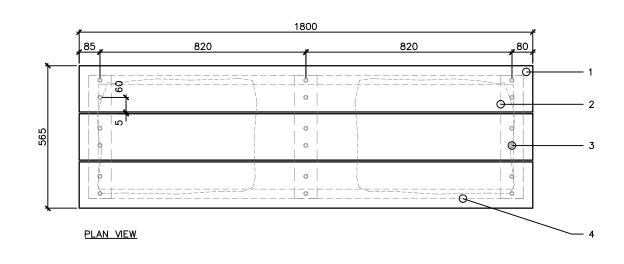
(1) SML-MD-L5-20G-A-HC - 3/0 X 6/8.50-REV-VRP 3-4.55

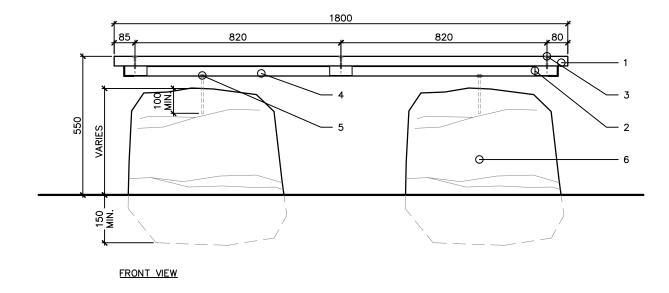
(3) STC-BB1409-F-1"X4"-26D (1) SHB-SH2 100-BC-BF-DA-AL CLOSER METAL ROOF - DURACLAD - COLOURED (MELCHER'S GREEN) 17-001 DUCOL

RIDGE ROLL CAP - #14 X 1½" COLOR SCREWS
CONVOY SUPPLY - 250-765-1441
140mm to 89mm (6" TO 4") PVC REDUCERS
OIL BASE WHITE PRIMER -> COVERCOAT SEMI-GLOSS LATEX WHITE
COVERCOAT 784N KANANASKIS GREEN

LAST REVISED AUG 28/15 32 36 10.02 SCALE 1: 25





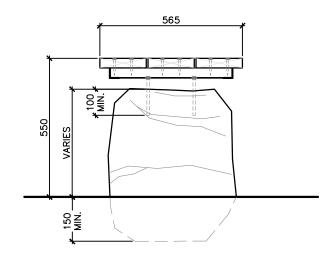


- 1 38 X 184mm (2 X 8") DIMENSIONAL DOUGLAS FIR BENCH TOP
- 2 38 X 89mm (2 x 4") PRESSURE TREATED MOUNTING BLOCK ATTACHED TO METAL FRAME USING 6 X 76mm (\$\frac{1}{2}\$ X 3") LENGTH HEX SCREWS

 3 ATTACH BENCH TOP TO MOUNTING BLOCK USING
- (6) 6 X 64mm ($\frac{1}{4}$ X $2\frac{1}{2}$ ") LENGTH HEX SCREWS
- 4 ALUMINUM BENCH FRAME REFER TO DRAWING 32 36 13.02
- 5 ATTACH ALUMINUM FRAME TO BOULDER USING 10mm (3") HEX BOLT ASSEMBLIES 6 +/- 457W X 610H X 610mmL (18 X 24 X 24")
- BOULDER BASE

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL
 B HEX BOLT ASSEMBLY INCLUDES HEX BOLT, (2) WASHERS, (2)
 NUTS & HILTI HIT HY 200 EPOXY OR APPROVED EQUAL
 C COUNTERSINK ALL BOLTS TO THE SPECIFIED WASHER SIZE AND TO
 ENSURE THE BOLTS DO NOT EXTEND BEYOND SURFACE OF THE
- WOOD.

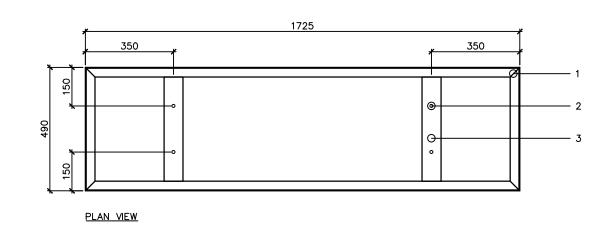
 D ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
 E ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF
 SIKKENS CETOL 1, COLOUR 'NATURAL 078'



SIDE VIEW

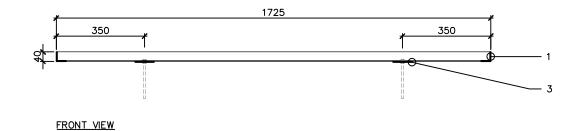
32 36 13.01 SCALE 1:15

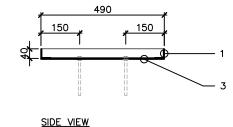




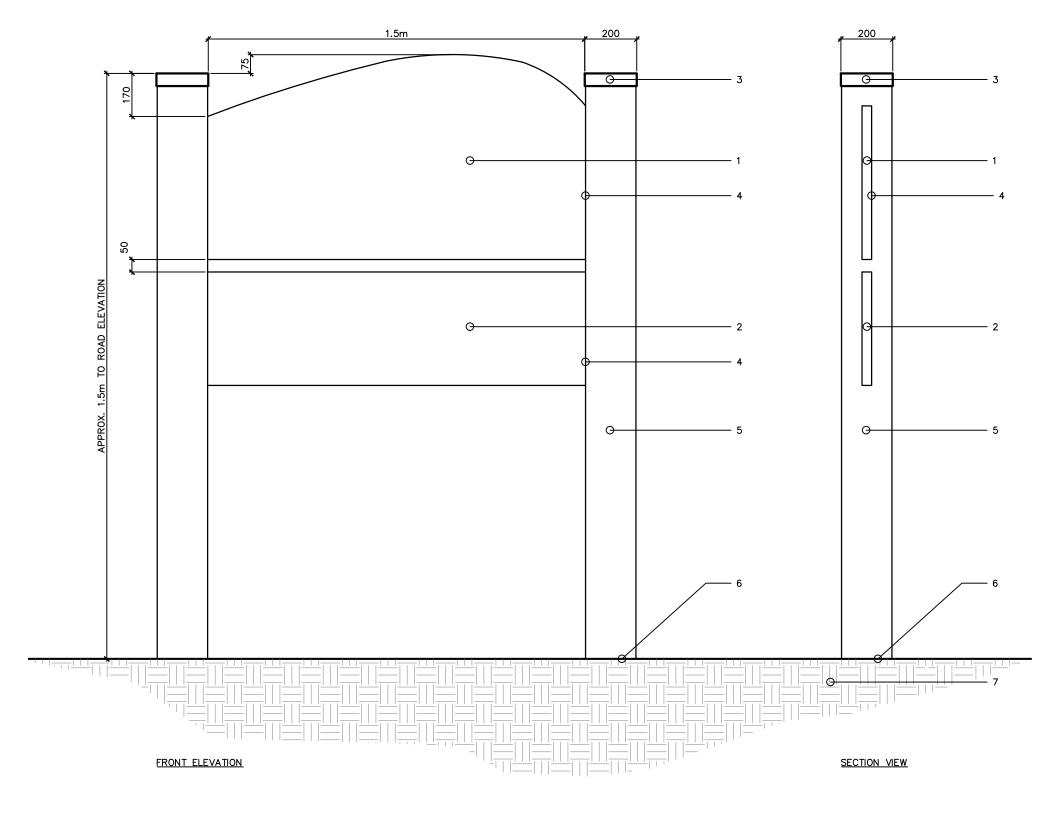
- 1 38 X 38 X 6mm (1½ X 1½ X ½") ALUMINUM ANGLE IRON EXTERIOR FRAME WELDED TOGETHER AT CORNERS ON A 45° ANGLE
- 2 PRE-DRILLED HOLE TO FIT A 10mm (§") HEX BOLT ASSEMBLY
- 3 6mm (‡") ALUMINUM FLAT BAR WELDED TO BOTTOM OF ANGLE IRON

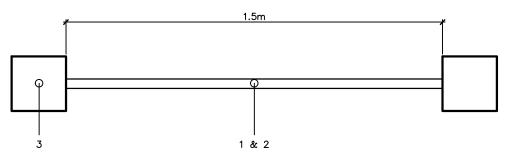
- A ALL WELDS SHALL BE CONTINUOUS, CLEAN AND ALL BURRS TO BE REMOVED PRIOR TO POWDER COATING B ALL METAL COMPONENTS SHALL BE POWDER COATED (RAL 9005, "JET BLACK") OR APPROVED EQUAL











PLAN VIEW

- PARK ENTRY SIGN (SUPPLIED BY THE RDCO)
- WILDFIRE RATING SIGN (SUPPLIED BY THE RDCO)
- 203 X 203mm (8 X 8") TIMBER POST CAP (SUPPLIED BY THE RDCO). REFER TO SUPPLEMENTARY DETAIL 32 36 14.10. ATTACH CAP TO
- POSTS WITH (4) 6 X 25mm (X 1") LAG SCREWS 4 SIGNS ATTACHÉD TO POSTS W/ 76 X 101 X 482mm (3 X 4 X 19") ANGLE BRACKET 5mm $(\frac{3}{16}")$ THICKNESS. ATTACH TO POSTS WITH (2) 9 X 203mm (3 X 8") HEX BOLT ASSEMBLIES. ATTACH TO SIGN WITH
- (4) 10 X 64mm (§ X 2½") LAG SCREW ASSEMBLIES
 203 X 203mm (8 X 8") ROUGH SAWN DOUGLAS FIR POST. POST LENGTH DEPENDENT ON FOOTING TYPE
- 203 X 203mm (8 X 8") SIGN STRUCTURE FOOTING FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 36 14.12
- UNDISTURBED SUBGRADE

NOTES:

- A SIGN HEIGHT IS MEASURED FROM NEAREST TRAVELED ROADWAY EDGE, NOT FROM FINISH ELEVATION BELOW SIGN. THIS IS TO ACCOMMODATE SIGNS THAT MAY BE INSTALLED ON LANDS HIGHER OR LOWER THAN THE ADJACENT ROADWAY.

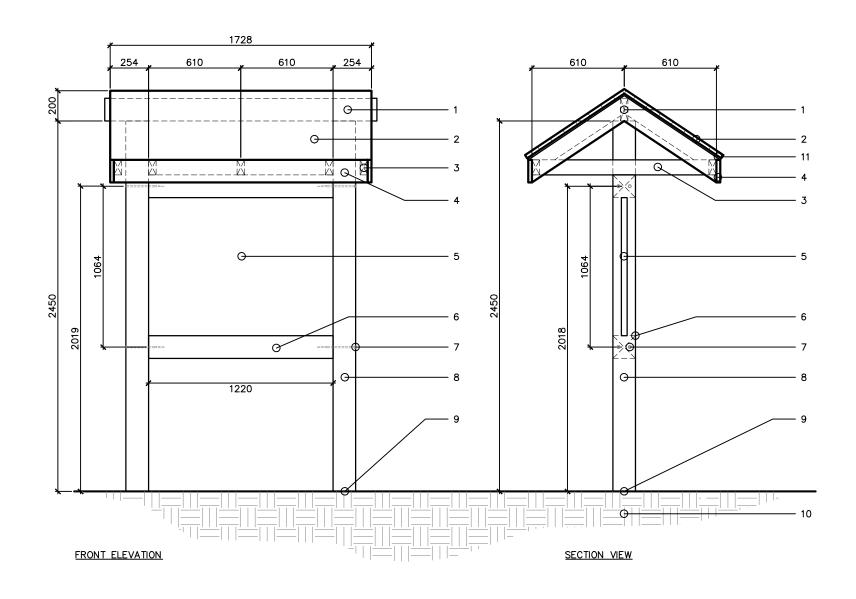
 B ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL

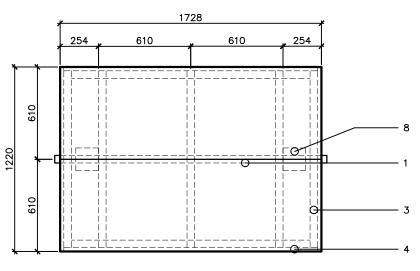
- C HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER & NUT
 D PRE-DRILL POSTS TO ACCEPT 16mm (§") GALVANIZED LAG BOLTS
 E COUNTERSINK ALL BOLTS/SCREWS TO THE SPECIFIED WASHER SIZE AND TO ENSURE THE HEADS DO NOT EXTEND BEYOND SURFACE OF THE WOOD.
- F LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER
- G ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
- F ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF SIKKENS CETOL 1, COLOUR 'BUTTERNUT 072'

SIGN STRUCTURE: PARK ENTRY SIGN

LAST REVISED AUG 28/15 32 36 14.01 SCALE 1:15







PLAN VIEW

- 1 38 X 140mm (2 X 6") DOUGLAS FIR CROSS BEAM 2 METAL ROOF ATTACHED TO 25 X 101mm (2 X 4")
- WOOD STRAPPING USING #14 X 38mm (11/2") MELCHER'S GREEN ROOFING SCREWS.
- 3 38 X 89mm (2 X 4") FIR RAFTERS
- 4 19 X 140mm (1 X 6") S4S FIR FACIA
- KIOSK SIGN & FRAME (SUPPLIED BY THE RDCO)
 152mm X 152mm (6 X 6") ROUGH SAWN DOUGLAS
 FIR SIGN SUPPORT FRAME
- 7 10 X 254mm (§ X 10") LAG SCREW ASSEMBLIES
 8 152 X 152mm (6"X6") ROUGH SAWN DOUGLAS FIR
 POST. POST LENGTH DEPENDENT ON FOOTING TYPE
 9 152mm (6") KIOSK POST BRACKET FOOTING
- REFER TO SUPPLEMENTARY DETAIL 32 36 14.12
- 10 UNDISTURBED SUBGRADE
- 11 13mm $(\frac{1}{2})$ PLYWOOD

NOTES:

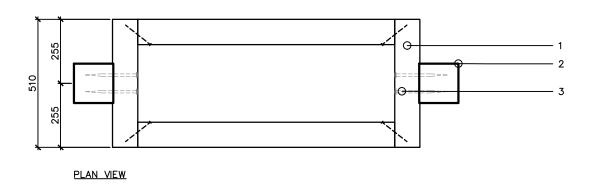
- A METAL ROOF TO BE 29 GA WESTFORM DURACLAD, MELCHER'S GREEN COLOUR; 36" ACTUAL COVERAGE, 18mm RAISE PROFILE, 225mm O.C. PROFILE

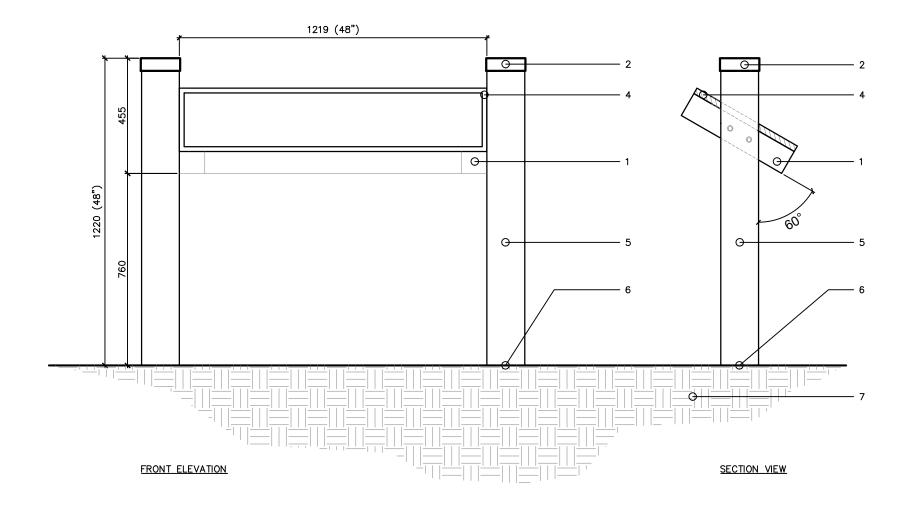
- D LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER

 E COUNTERSINK ALL BOLTS/SCREWS TO THE SPECIFIED WASHER SIZE AND TO ENSURE THE HEADS DO NOT EXTEND BEYOND SURFACE OF THE WOOD
- F ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
- G ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF SIKKENS CETOL 1, COLOUR 'NATURAL 078'

LAST REVISED AUG 28/15 32 36 14.02 SIGN STRUCTURE: KIOSK SCALE 1: 25







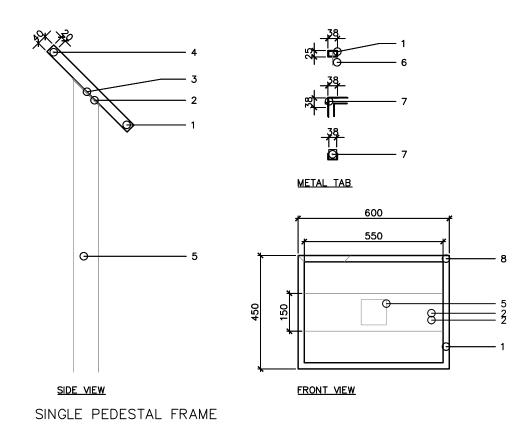
- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER
- C COUNTERSINK ALL BOLTS/SCREWS TO THE SPECIFIED WASHER SIZE AND TO ENSURE THE HEADS DO NOT EXTEND BEYOND SURFACE OF THE WOOD.
- D ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
 E ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF
 SIKKENS CETOL 1, COLOUR 'NATURAL 078'
- 1 114mm X 114mm (4½ X 4½")ROUGH SAWN DOUGLAS FIR SIGN SUPPORT FRAME FASTENED TOGETHER W/ (2) 76mm (3") LONG DECK SCREWS @ EACH CORNER
- 2 152 X 152mm (6 X 6") TIMBER POST CAP (SUPPLIED BY THE RDCO). REFER TO SUPPLEMENTARY DETAIL 32 36 14.10. ATTACH CAP TO POSTS WITH (4) 6 X 25mm (X 1") LAG SCREWS
 3 ATTACH SIGN SUPPORT FRAME TO POSTS FROM INSIDE WITH (2)
- 10 X 152mm (§ X 6") LAG BOLT ASSEMBLIES
 4 ALUMINUM LECTERN SIGN & FRAME (SUPPLIED BY THE RDCO)
 5 152 X 152mm (6 X 6") ROUGH SAWN DOUGLAS FIR POST. POST
- LENGTH DEPENDENT ON FOOTING TYPE
- 6 152 X 152mm (6 X 6") SIGN STRUCTURE FOOTING. FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 36 14.11
 7 UNDISTURBED SUBGRADE

SIGN STRUCTURE: LECTERN

LAST REVISED AUG 28/15 SCALE

32 36 14.03 1:15





- 25mm (1") FACE FRONT ALUMINUM SQUARE TUBE POWDER COATED GLOSS BLACK
- SUPPORT SLAT WELDED FLUSH TO THE BOTTOM OF THE FRAME ON UNDERSIDE OF KERF POST CUT AT 45° ANGLE AND WELDED TO FRAME CROSS
- BRACE
- PRE-DRILLED HOLE COUNTERSUNK TO FIT A METAL #8
 SCREW TO ATTACH TO FRAME

 5 101 X 101 X 1524mm (4" X 4" X 5') ALUMINUM POST
- POWDER COATED GLOSS BLACK
- 6 ALUMINUM SIGN (SUPPLIED BY RDCO)

 7 3mm (\$\frac{1}{2}") THICK METAL TAB WELDED TO ALLOW REMOVABLE TOP PIECE TO FIT SNUGLY IN FRAME PRE-DRILLED HOLE TO FIT A METAL #8 SCREW TO ATTACH TO FRAME
- 8 45' CORNER REMOVABLE SECTION W/ METAL ANGLE TAB

- A ALL WELDS SHALL BE CONTINUOUS, CLEAN AND ALL BURRS TO BE REMOVED PRIOR TO PAINTING AND/OR POWDER COATING
- B ALL METAL COMPONENTS SHALL BE POWDER COATED (RAL 9005, "JET BLACK") OR APPROVED EQUAL
- C A INTERPRETIVE PANEL SIZE: 17.25" X 23.25" TO FIT IN FRAME (SUPPLIED BY RDCO)

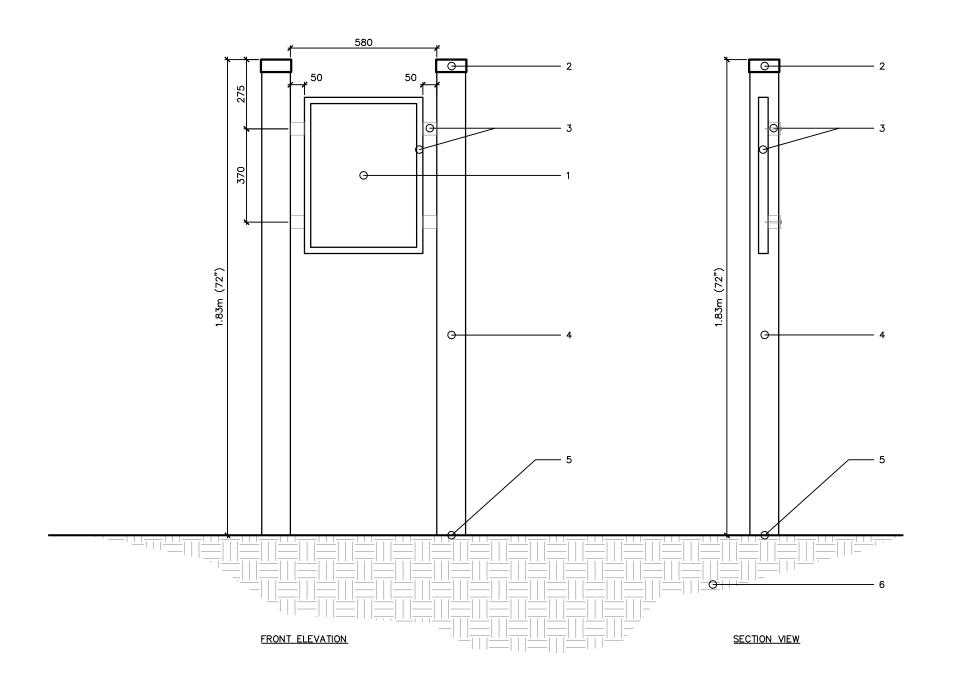
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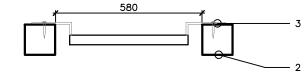
SIGN STRUCTURE: PEDESTAL

LAST REVISED AUG 28/15 SCALE

32 36 14.04 1:15







PLAN VIEW

- 1 PARK ORIENTED MAP (SUPPLIED BY THE RDCO)
- 2 114 X 114mm (4½ X 4½") TIMBER POST CAP (SUPPLIED BY THE RDCO). REFER TO SUPPLEMENTARY DETAIL 32 36 14.10. ATTACH CAP TO POSTS WITH (4) 6 X 25mm (½ X 1") LAG SCREWS

 3 ALUMINUM LOCATION SIGN FRAME (SUPPLIED BY THE RDCO). REFER TO SUPPLEMENTARY DETAIL 32 36 15.03. ATTACH TO POSTS WITH (4) 6 X 64mm (½ X 2½") LAG SCREWS
- 4 114 X 114mm (4½ X 4½") ROUGH SAWN DOUGLAS FIR POST. POST LENGTH DEPENDENT ON FOOTING TYPE
- tength dependent on Foothing Tipe

 114 X 114mm (4½ X 4½") SIGN STRUCTURE FOOTING. FOOTING
 TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO
 SUPPLEMENTARY DETAIL 32 36 14.11

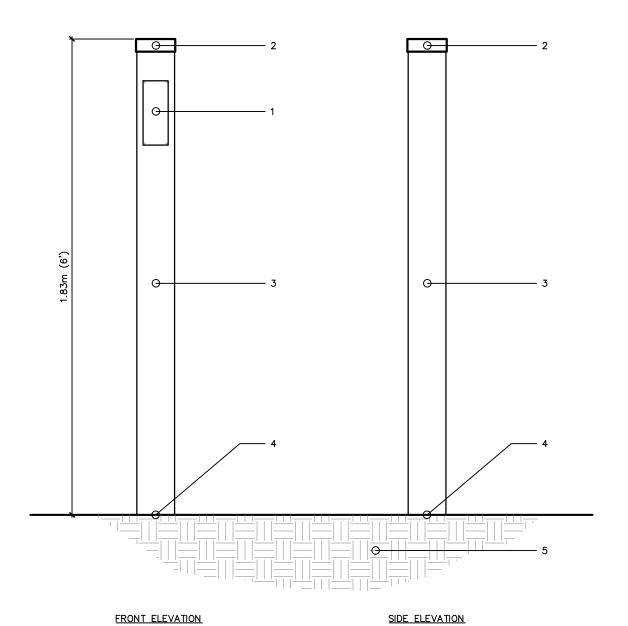
 6 UNDISTURBED SUBGRADE

NOTES:

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B HEX BOLT ASSEMBLY INCLUDES HEX BOLT, WASHER & NUT
- C PRE-DRILL POSTS TO ACCEPT 16mm (§") GALVANIZED LAG BOLTS
 D COUNTERSINK ALL BOLTS TO THE SPECIFIED WASHER SIZE AND
 TO ENSURE THE BOLTS DO NOT EXTEND BEYOND SURFACE OF

- F LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER
 F ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
 G ALL WOOD COMPONENTS TO BE STAINED WITH (2) COATS OF
 SIKKENS CETOL 1, COLOUR 'NATURAL 078'





- 1 PARK DIRECTIONAL SIGN (SUPPLIED BY THE RDCO)
 2 152 X 152mm (6 X 6") TIMBER POST CAP
 (SUPPLIED BY THE RDCO). REFER TO SUPPLEMENTARY DETAIL 32 36 14.10. ATTACH CAP TO POSTS WITH (4) 6 X 25mm ($\frac{1}{4}$ X 1") LAG SCREWS

 3 152 X 152mm (6 X 6") ROUGH SAWN DOUGLAS FIR POST. POST LENGTH DEPENDENT ON FOOTING TYPE

 4 152 X 152mm (6 X 6") SIGN STRUCTURE FOOTING.
- FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS.
 REFER TO SUPPLEMENTARY DETAIL 32 36 14.11
 5 UNDISTURBED SUBGRADE

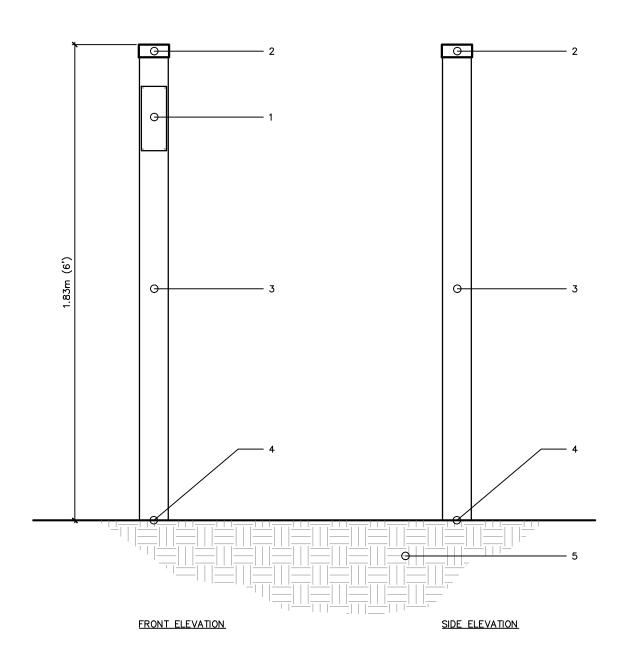
- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER
- C COUNTERSINK ALL BOLTS/SCREWS TO THE SPECIFIED
- WASHER SIZE AND TO ENSURE THE HEADS DO NOT EXTEND BEYOND SURFACE OF THE WOOD.
- D ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
- E ALL WOOD COMPONENTS TO BE STAINED WITH (2)
 COATS OF SIKKENS CETOL 1, COLOUR 'NATURAL 078'

SIGN STRUCTURE: DIRECTIONAL POST

LAST REVISED AUG 28/15 SCALE 1:15

32 36 14.06





- 1 PARK BLAZE SIGN (SUPPLIED BY THE RDCO)
- 2 114 X 114mm (4½ X 4½") TIMBER POST CAP (SUPPLIED BY THE RDCO). REFER TO SUPPLEMENTARY DETAIL 32 36 14.10. ATTACH CAP
- TO POSTS WITH (4) 6 X 25mm ($\frac{1}{4}$ X 1") LAG SCREWS 3 114 X 114mm (4 $\frac{1}{2}$ X 4 $\frac{1}{2}$ ") ROUGH SAWN DOUGLAS FIR POST. POST LENGTH DEPENDENT ON FOOTING TYPE
- 4 114 X 114mm (4½ X 4½") SIGN STRUCTURE FOOTING. FOOTING TYPE IS DEPENDENT ON SITE CONDITIONS. REFER TO SUPPLEMENTARY DETAIL 32 36 14.11
- 5 UNDISTURBED SUBGRADE

- A ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL B LAG SCREW ASSEMBLY INCLUDES SCREW & WASHER
- C COUNTERSINK ALL BOLTS/SCREWS TO THE SPECIFIED
- WASHER SIZE AND TO ENSURE THE HEADS DO NOT EXTEND BEYOND SURFACE OF THE WOOD.

 D ALL WOOD TO BE #2 GRADE OR BETTER DOUGLAS FIR
- E ALL WOOD COMPONENTS TO BE STAINED WITH (2)
 COATS OF SIKKENS CETOL 1, COLOUR 'NATURAL 078'

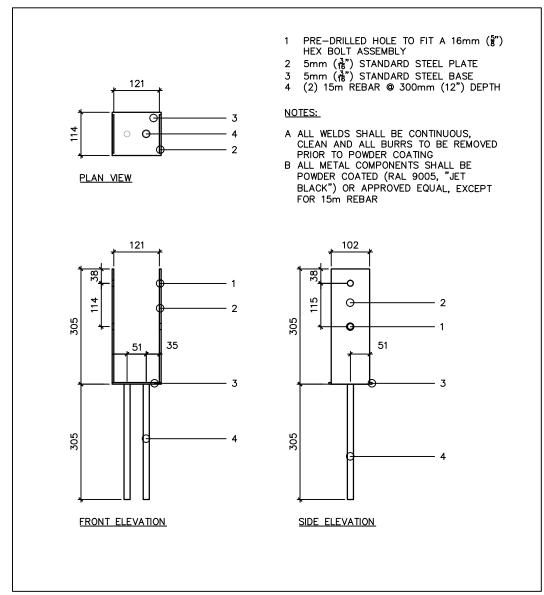
SIGN STRUCTURE: BLAZE POST

LAST REVISED AUG 28/15 SCALE

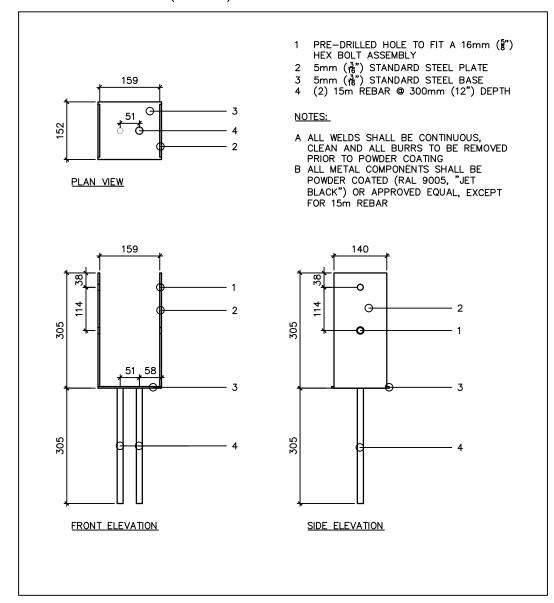
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114 X 114mm $(4\frac{1}{2}$ X $4\frac{1}{2}$ ") TIMBER POST BRACKET



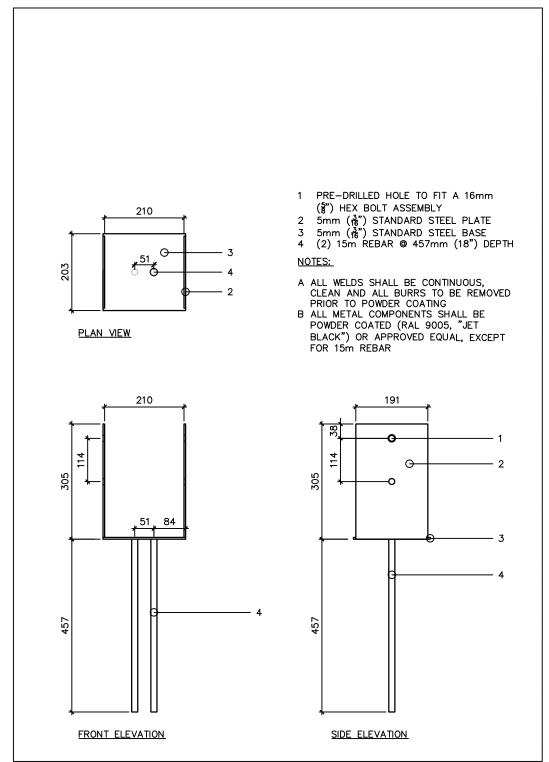
152 X 152mm (6 X 6") TIMBER POST BRACKET



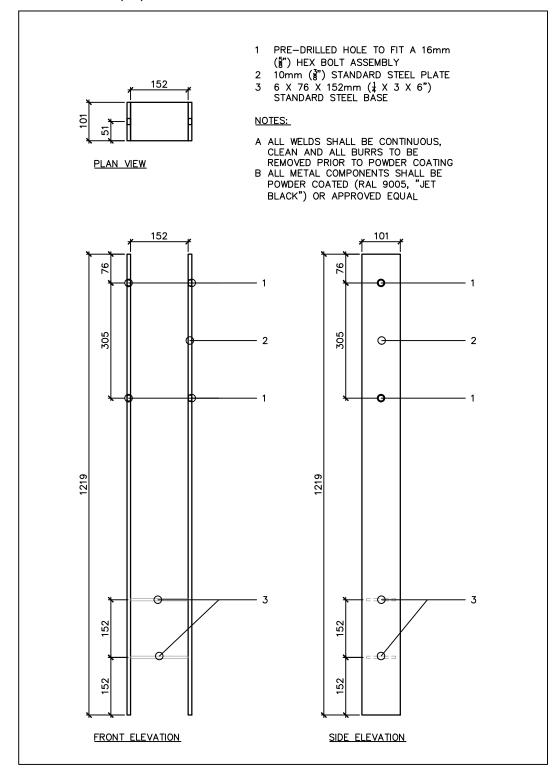
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203 X 203mm (8 X 8") TIMBER POST BRACKET



152mm (6") KIOSK POST BRACKET



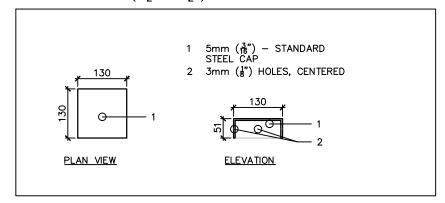
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LAST REVISED | DRAWING NO. | AUG 28/15 | | 32 36 14.09 |

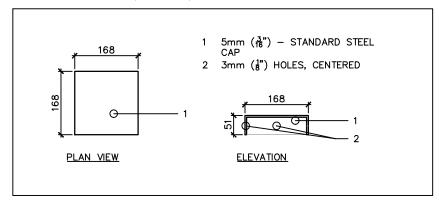


- A ALL WELDS SHALL BE CONTINUOUS, CLEAN AND ALL BURRS TO BE REMOVED PRIOR TO POWDER COATING
- B ALL METAL COMPONENTS SHALL BE POWDER COATED (RAL 9005, "JET BLACK") OR APPROVED EQUAL

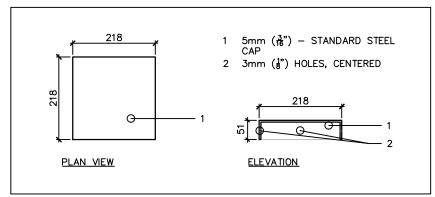
114 X 114mm $(4\frac{1}{2} \times 4\frac{1}{2})$ TIMBER POST CAP



152 X 152mm (6 X 6") TIMBER POST CAP



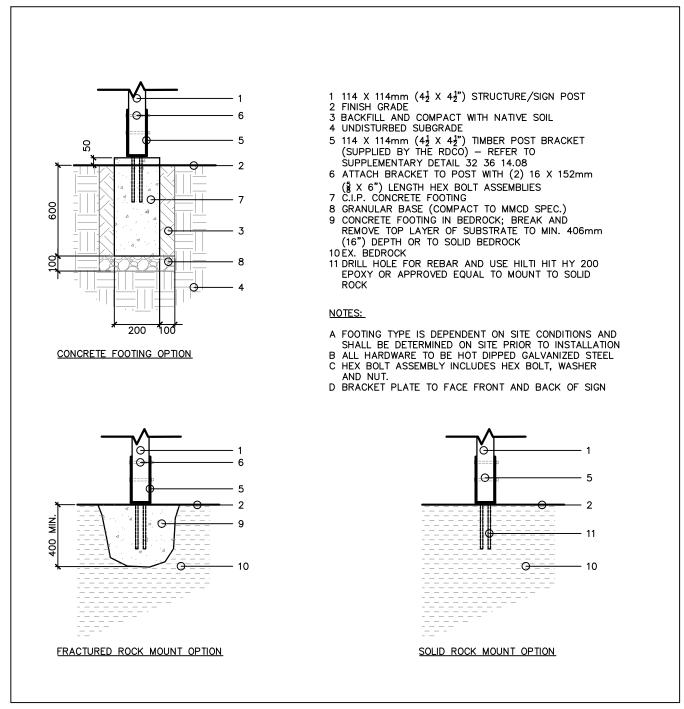
203 X 203mm (8 X 8") TIMBER POST CAP



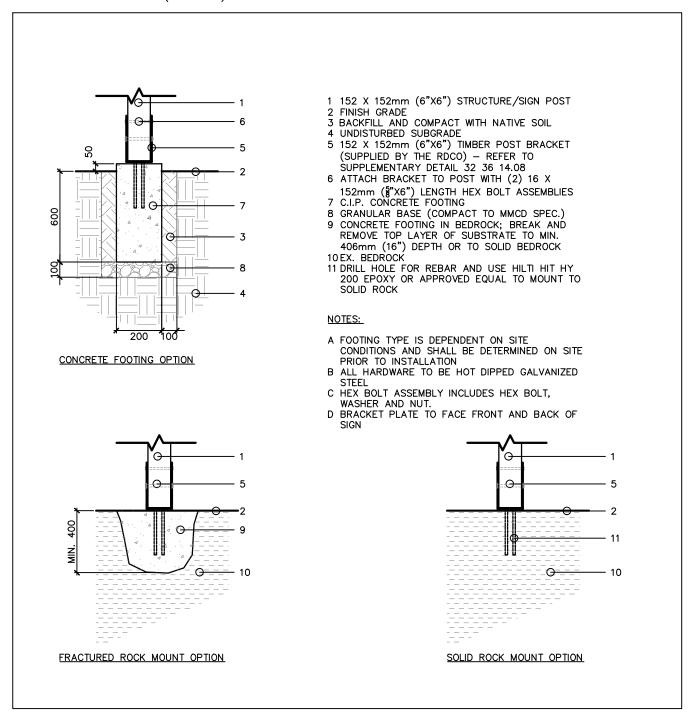
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114 X 114mm $(4\frac{1}{2}$ X $4\frac{1}{2}$ ") SIGN STRUCTURE FOOTING

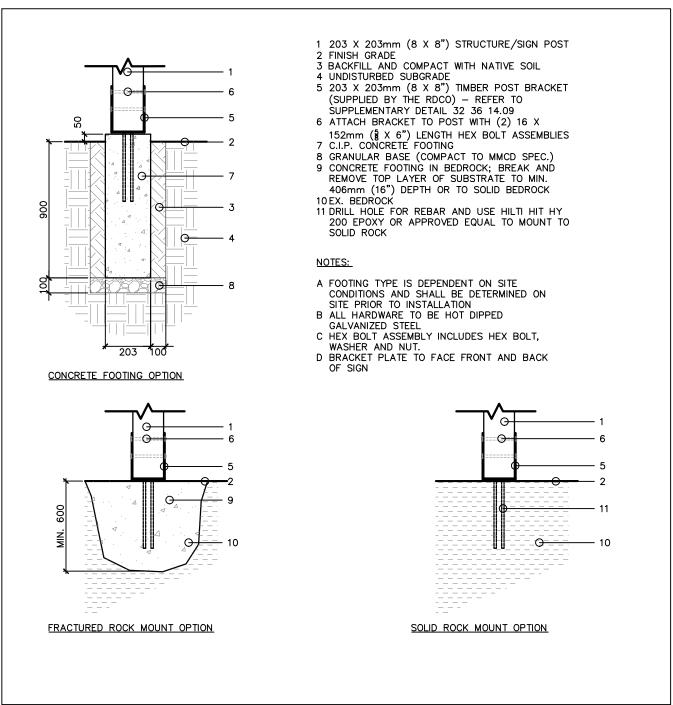


152 X 152mm (6 X 6") SIGN STRUCTURE FOOTING

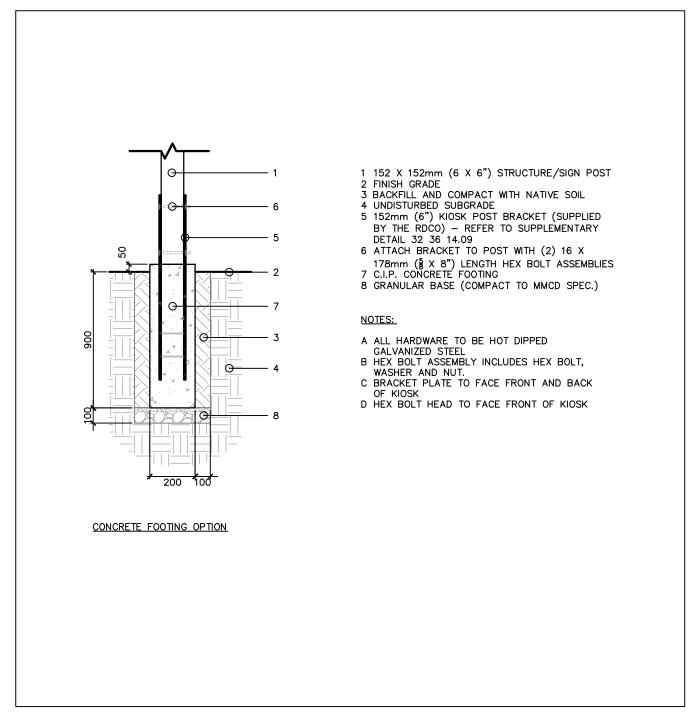




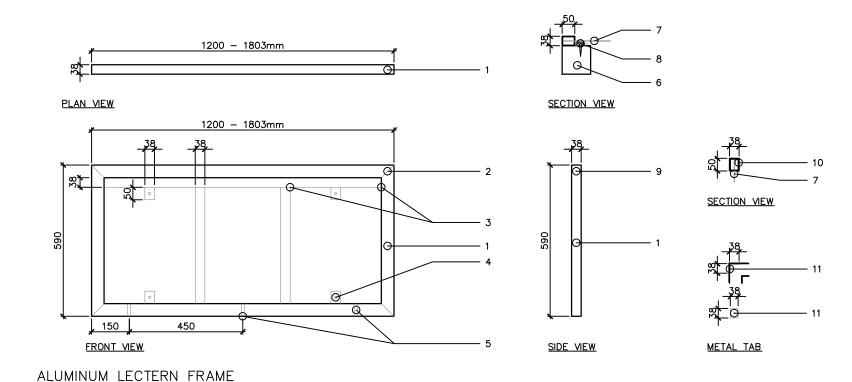
203 X 203mm (8 X 8") SIGN STRUCTURE FOOTING



152mm (6") KIOSK POST BRACKET FOOTING







- 51mm (2") FACE FRONT ALUMINUM SQUARE TUBE 45' CORNER REMOVABLE SECTION W/ METAL ANGLE TAB
- SUPPORT SLATS AND TABS WELDED FLUSH TO ONE ANOTHER AND THE BOTTOM OF FRAME ON UNDERSIDE OF THE KERF

- MEIAL TABS
 6mm (‡") WEEP HOLES DRILLED IN BOTTOM
 114 X 114mm (4½ X 4½") WOOD STRUCTURE
 ALUMINUM SIGN (SUPPLIED BY RDCO)
 THICKNESS OF METAL TABS PLUS SCREW HEAD NOT
 TO IMPEDE PASSAGE OF ALUMINUM PANEL
 PRE-DRILLED HOLE TO TO FIT A #8 METAL SCREW
 TO ATTACH TO FRAME
 ALUMINUM SOLVABE CORNIER TUBE
- 10 ALUMINUM SQUARE CORNER TUBE
- 11 3mm (1") THICK METAL TAB, WELDED TO ALLOW REMOVABLE TOP PIECE TO FIT TIGHT IN THE FRAME

- A ALL WELDS SHALL BE CONTINUOUS, CLEAN AND ALL BURRS TO BE REMOVED PRIOR TO PAINTING AND/OR
- POWDER COATING

 B ALL METAL COMPONENTS SHALL BE POWDER COATED
 (RAL 9005, "JET BLACK") OR APPROVED EQUAL

 C INTERPRETIVE SIGN SIZE: 590 X 1200–1803mm
 (23.25 X 47.25–71.25") TO FIT IN FRAME (LENGTH TO BE SPECIFIED INDIVIDUALLY)

DRAWING TITLE

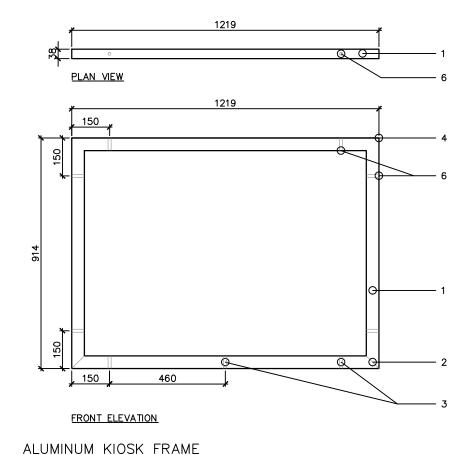
SIGN FRAME: ALUMINUM LECTERN FRAME

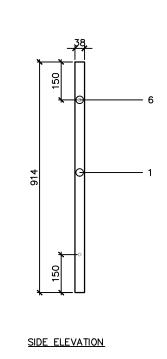
LAST REVISED FEB 28/15

32 36 15.01

SCALE 1:15



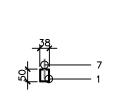


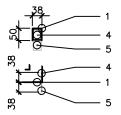


- 51mm (2") FACE FRONT ALUMINUM SQUARE TUBE, POWDER COATED GLOSS BLACK
 45° CORNER REMOVABLE SECTION W/ METAL ANGLE TAB

- 3 6mm (‡") WEEP HOLES DRILLED IN BOTTOM
 4 3mm (‡") THICK UPPER METAL TAB WELDED TO ALLOW MOVEABLE BOTTOM PIECE TO FIT SNUGLY IN THE FRAME & ATTACH SECURELY TO WOODEN POST
- 5 6mm (‡") THICK LOWER METAL TAB 6mm (‡") HOLE PRE-DRILLED AND COUNTERSUNK TO ALLOW FASTENER TO SIT FLUSH W/ TAB
- 6 6mm (1") HOLES PRE-DRILLED ON SIDES AND TOP (2) EACH SIDE FOR TOTAL OF 6 HOLES
 7 (2) ALUMINUM SIGNS, BLANK

A INTERPRETIVE SIGN SIZE: 895 X 1200mm (35 $\frac{1}{4}$ X 47 $\frac{1}{4}$ ") TO FIT FRAME





SECTION VIEW

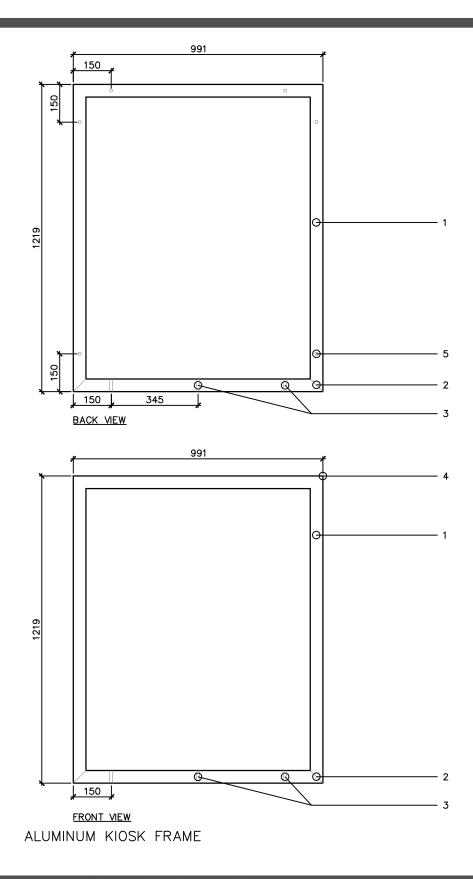
METAL TAB

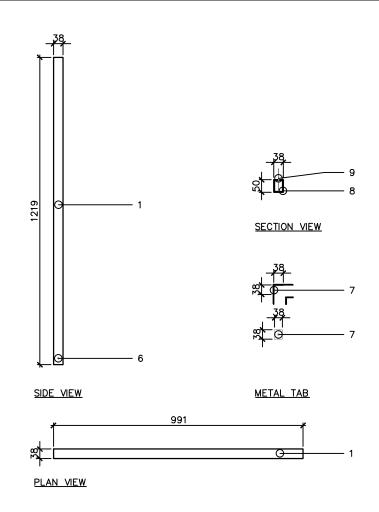
DRAWING TITLE

SIGN FRAME: ALUMINUM INTERPRETIVE SIGN FRAME (36 X 48")

LAST REVISED FEB 28/15 32 36 15.02 SCALE 1:15







- 1 51mm (2") FACE FRONT ALUMINUM SQUARE TUBE, POWDER COATED GLOSS BLACK

- COATED GLOSS BLACK

 2 45° CORNER REMOVABLE SECTION W/ METAL ANGLE TAB

 3 6mm (\frac{1}{2}") WEEP HOLES DRILLED IN BOTTOM

 4 WELDED NEATLY AT CORNERS

 5 38 51mm (\frac{1}{2}" 2") BOLTS WELDED TO REVERSE SIDE OF FRAME ON THE TOP AND SIDES. 2 BOLTS EACH SIDE FOR A TOTAL OF 6 BOLTS

 6 PRE-DRILLED HOLE, COUNTERSUNK TO FIT A #8 METAL SCREW TO SECURE REMOVABLE PIECE

 7 3mm (\frac{1}{8}") THICK METAL TAB, WELDED TO ALLOW REMOVABLE TOP PIECE TO FIT SNUGLY IN THE FRAME

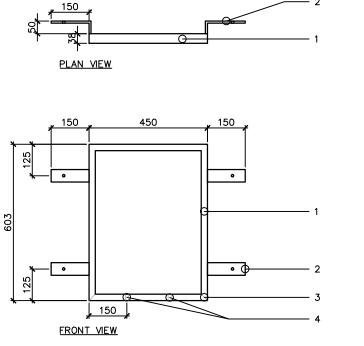
 8 ALUMINUM SQUARE CORNER TUBE

 9 ALUMINUM SIGN BLANK

- A INTERPRETIVE SIGN SIZE: 972 X 1200mm (38\frac{1}{4} X 47\frac{1}{4}") TO FIT FRAME
- B 4-SIDED KIOSKS VARY IN SIZE CHECK OUTSIDE MEASUREMENTS AND ADJUST ACCORDINGLY

LAST REVISED FEB 28/15 32 36 15.03 SCALE 1:15





ALUMINUM LOCATIONS SIGN FRAME

METAL TAB SECTION VIEW SIDE BRACKET

- 1 25 X 38 X 2mm WALL (1 X 1.5 X .08"WALL)
 ALUMINUM SQUARE TUBING
 2 SIDE BRACKETS WELDED NEATLY TO BACK
 EDGE OF FRAME
 3 45° CORNER REMOVABLE SECTION
 4 6mm (\{\frac{1}{2}\}") WEEP HOLES DRILLED ON BOTTOM
 5 10mm (\{\frac{3}{2}\}") HOLES FOR 8mm (\{\frac{5}{2}\}") LAG BOLT
 6 PRE-DRILLED HOLE TO FIT A METAL #8
 SCREW TO ATTACH TO FRAME
 7 METAL ANGLE TAB WELDED TO ALLOW
 REMOVABLE BOTTOM PIECE TO FIT SNUGLY IN
 THE FRAME
 8 ALUMINUM BLANK SIGN
- 8 ALUMINUM BLANK SIGN
 9 ALUMINUM SQUARE CORNER TUBE

NOTES:

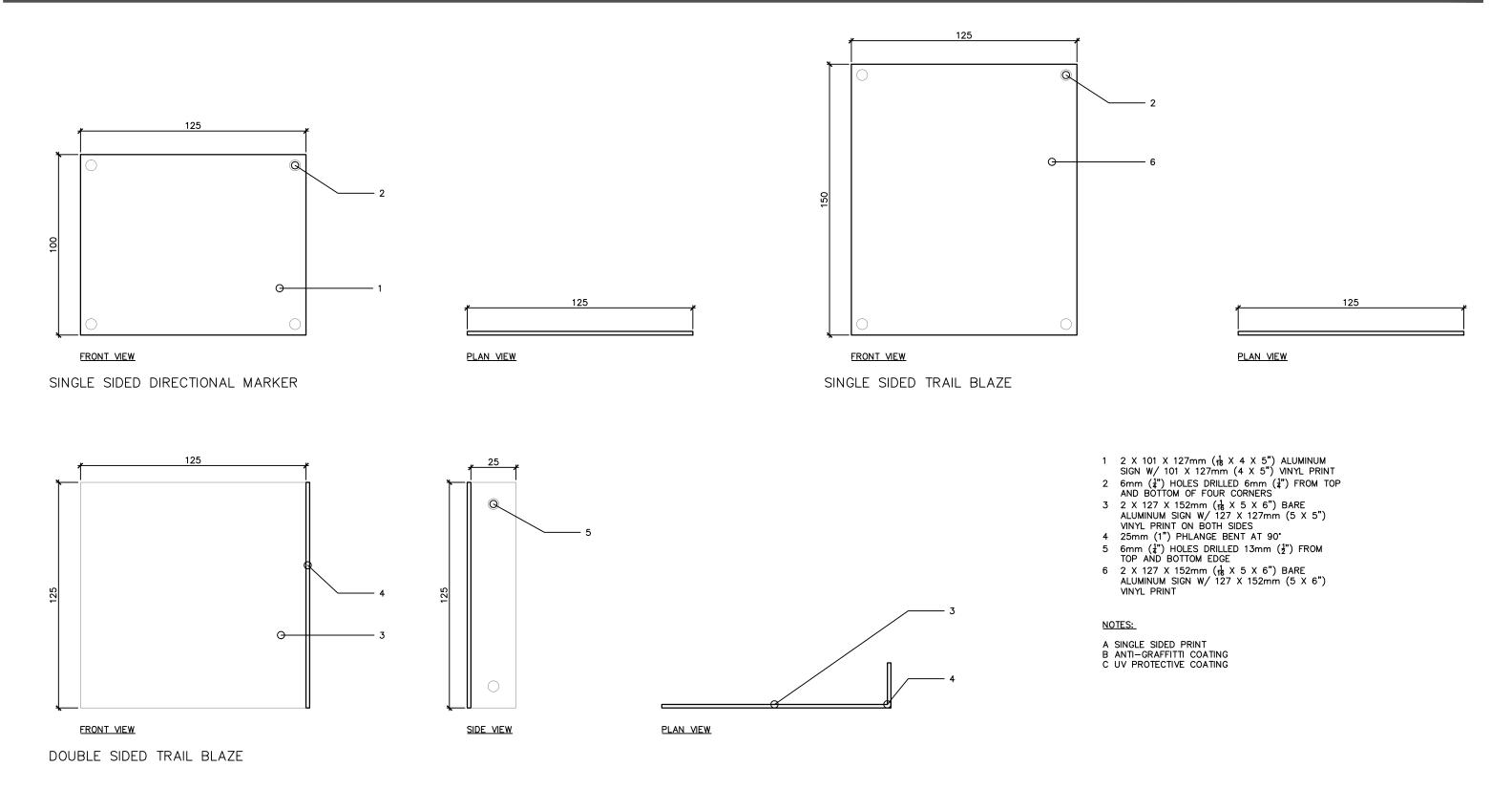
A INTERPRETIVE PANEL SIZE: 603 X 450mm (233 X 173") TO FIT IN FRAME

DRAWING TITLE

LAST REVISED AUG 28/15 32 36 15.04 SCALE 1:15

SUPPLEMENTARY DETAIL DRAWINGS





SIGN FRAME: TRAIL MARKER / BLAZE

LAST REVISED AUG 28/15 SCALE

32 36 15.05 1: 2

	Regional Parks Design Guidelines
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APPENDIX B: PARK & TRAIL CONSTRUCTION	SPECIFICATIONS


SUPPL	PARKS LEMENTARY FICATION	METAL FABRICATION	SECTION 05 50 00 - S PAGE 1 OF 6 2015
1.0	GENERAL	items as indicated on Draw including metal handrails, for gates, retaining walls, stairs, comfort stations, sign structur	re and installation of all metal rings and as specified herein, oting bases, mounting brackets, bridges, boardwalks, benches, e and signs. This section must ted simultaneously with all other
1.1	Related Work	<ul><li>.1 Cast-in-Place Concrete</li><li>.2 Fences &amp; Gates</li><li>.3 Retaining Walls</li><li>.4 Fabricated Stairs</li><li>.5 Fabricated Bridges</li><li>.6 Structures</li></ul>	Section 03 30 53 Section 32 31 00-S Section 32 32 00-S Section 32 33 00-S Section 32 34 00-S Section 32 36 00-S
	References	.1 National Ornamental and Misc	ellaneous Metals Association
		.2 CAN-85.100-93	
1.3	Quality Control	.1 Design of steel structures, un conform to CAN3-S16.1-M94.	it stresses and workmanship to
		.2 Welding work to conform to CS only be performed by organi under CSA Welding Qualificati	zations and operators qualified
		.3 Electrodes to conform to CSA	Standard W48.
			900. Surface preparation for steel to conform with Steel
		.5 Handrails when installed sh loading requirements. Maximu	all conform to local municipal um deflection 1/360 of the span.
1.4	Submittals	.1 Construct a sample panel of specified, then submit it to review and approval prior to m	the Contract Administrator for
1.5	Measurement and Payment	.1 Payment for metal fabricati component on the Schedule noted otherwise.	on will be inclusive in each of Quantities and Prices unless
		• • • • • • • • • • • • • • • • • • • •	ion of product samples as prication, finishing, painting and de the components shown on

### 2.0 PRODUCTS

### 2.1 Steel

- .1 Structural steel, decorative steel and miscellaneous steel shapes shall conform conforming to CAN3-G40.21-98, Grade 300W, 44W for flat shapes.
- .2 Seamless hollow structural sections shall conform to CAN3-G40.21, Grade 50W, Type H.
- .3 Pipe, standard weight, shall conform to ASTM Specification A53, Grade B. Include galvanized sleeves for setting verticals, as required. Bend as detailed.

### 2.2 Welding Electrodes

.1 Electrodes shall conform to CSA W48.

### 2.3 Fasteners

- .1 Fasteners shall be sized to suit material to which metalwork items are attached and shall meet loading requirements and CAN3-S16.1-94M.
- .2 Use fasteners of the same metal as the metal being fastened, unless indicated otherwise on the Contract Drawings. Do not use metals corrosive or otherwise incompatible with the materials joined. Use only stainless steel or galvanized fasteners.

### 2.4 Anchors

- .1 Anchors shall be fabricated from corrosion-resistant materials and be of the type indicated on the Drawings or, if not so indicated, as follows:
  - .1 Cast-in-place anchors
  - .2 Chemical anchors
  - .3 Expansion anchors
  - .4 Undercut anchors
- .2 Anchors, and connections thereto, in unit masonry and concrete shall have the capability to sustain, without failure, imposed loads as follows per ASTM E488:
  - .1 Unit masonry: up to 6 times the load imposed
  - .2 Concrete: up to 4 times the load imposed

### 2.5 Aluminum Extrusions

.1 6063 - T5 alloy free from defects strength, appearance and durability. Finish as noted on drawings as either baked enamel or anodized

SUPPLI	D PARKS LEMENTARY FICATION	METAL FABRICATION	METAL FABRICATION Section 05 50 00 - S PAGE 3 OF 6 2015	
2.6	Stainless Steel	.1 Fittings shall be of the types indica fabricated from stainless steel and sustain, without failure, a load equal to strength of the wire rope with which the	with the capability to the minimum breaking	
2.7	Checkerplate	.1 Checkerplate shall be 5mm thick alumin size 0.9m x 1.2m, with regularly-patte appurtenances to provide secure footing	rned bas-relief surface	
2.8	Primer and Paint	.1 Paint and primer for all metal work sh Contract Drawings and/or in the RDCC Guidelines		
3.0	EXECUTION			
3.1	Examination	.1 Prior to fabrication examine all details work as it relates to this Section and actual dimensions of this work and othe measurements before fabrication. Ens and surfaces are suitable to prov satisfactory installation.	other Sections. Check or work by accurate field sure that all conditions	
		.2 Report defects and discrepancie Administrator. Do not undertake fabrica defects and discrepancies have be Contractor shall be responsible for associated with unresolved defects and	ation or installation until een resolved. The deficiencies and costs	
3.2	Coordination	.1 Coordinate templates, bolt patterns an other trades as required.	d field dimensions with	
3.3	Fabrication	.1 Design of steel structures, unit stresse conform to CAN3-S16.1-M94.	es and workmanship to	
		.2 Welding work to conform to CSA Stand only be performed by organizations a under CSA Welding Qualification Code;	and operators qualified	
		.3 Fabricate all work in accordance we Contract Drawings and Shop Drawing required sizes and shapes, with true ling Provide components in sizes and proless than required to comply with required performance.	s. Form metalwork to nes, curves and angles. files indicated, but not	

.4 Where possible fabricate work in shop. Provide steel framing and supports as necessary to assemble the work. Fit and

- shop assemble work in largest practical sections for delivery to the site.
- .5 Cut, fabricate and assemble work true, square and to required dimensions, free from warping, deflections and other defects.
- .6 Ease exposed edges to a radius of approximately 1mm, unless otherwise indicated. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- .7 Curved work shall be true to radii shown on Contract Drawings.
- .8 Cut, drill and tap metal fabrications cleanly and accurately as indicated to receive hardware, screws and attachment of other work. Remove burrs.
- .9 Locate and affix joints, connections and fastenings such that, when the work is installed, they are inconspicuous or hidden from view consistent with the design and position of the component.

### .10 Weld connections such that:

- .1 Materials and methods used minimize distortion and develop strength and corrosion resistance of base metals.
- .2 Welds are continuous for the length of each joint.
- .3 Joints exposed to water shed, drain or exclude water such that water will not accumulate.
- .4 Fusion is achieved without undercut or overlap.
- .5 Welding flux is removed immediately.
- .11 Finish connections such that exposed welds, spatters, sharp edges, angles and corners are ground and finished as follows:
  - .1 Invisible welds NOMMA #4 joint finish guideline.
  - .2 Inconspicuous welds NOMMA #3 joint finish guideline.
  - .3 Conspicuous welds, including visible welds and those within arm's reach of people using the metal component or the area adjacent to it NOMMA #2 joint finish guideline.
- .12 Tighten bolted work with tamper-proof bolts or with threads of bolts nicked to prevent subsequent loosening, unless work indicated is noted as removable.
- .13 Adjust mechanical components and moving parts for smooth operation, silent and free from resistance for the intended use.
- .14 Provide a smooth finish for cast components. Grind, wire brush, sandblast and buff casting to remove seams, gatemarks, casting flash and other casting marks.

.15 Clean oil, grease and dirt from exposed surfaces and prepare for galvanizing or painting. Use solvent or detergent washing, steam cleaning or high pressure washing. Thoroughly rinse cleaning products from steel and set work to dry in an environment free from dust, aerosols and fumes.

# 3.4 Painting – Spray

- .1 Immediately after the cleaned metalwork has dried apply a coat of primer using a sprayer in accordance with the manufacturer's instructions.
- .2 Apply paint coat using a sprayer in accordance with the manufacturer's instructions.
- .3 Apply primer and paint to provide continuous and uniform coverage so that the finish is smooth and uniform in appearance, colour, texture and gloss. Give special attention to edges, angles, weld seams, holes and other places where insufficient film thickness is likely to occur. Use brushes as required for surfaces not adequately covered by spray. There shall be no ridges, sagging or wrinkling. There shall be no evidence of craters, pinholes, dirt or coarse particles.
- .4 Do not handle painted metal until paint has dried, except for necessary handling for painting or stacking for drying.
- .5 Do not prime or paint surfaces to be welded in the field. Once welding is completed prime and paint surface as specified herein.
- .6 Apply touch-up primer and paint in the field as required after assembly of structure is complete. Primer and paint shall be as specified.

# 3.5 Painting – Powder Coating

- .1 Powder coat a 450mm x 450mm sample of the metalwork as specified on the Contract Drawings and in this Section. Do not powder coat metal work components prior to receipt of approval for metal work and powder coat samples.
- .2 Apply powder coating to match approved sample, leaving final surfaces uniform. Hard and dry and free from foreign matter and other flaws. Repair flawed items completely; patching will not be acceptable.
- .3 Employ alkaline cleaning process or equivalent as required to clean oil, grease and dirt from exposed surfaces and prepare for powder coating. Rinse as required and dry. Powder coat metal work immediately after cleaning.
- .4 Pre-heat components to be powder coated as required to help prevent out-gassing before powder coat application.

- .5 Following the manufacturer's instructions apply two coats of polyester powder coating to match the approved sample. Do not coat surfaces to be field welded. Powder coat thickness shall be 3.0mils.
- .6 Powder coat finish shall be uniformly smooth and glossy, of the colour specified on the Contract Drawings. Powder coating finish shall be hard and dry, free of contamination and other flaws. Repair flawed items completely. Patching will not be acceptable.

### 3.6 Installation

- .1 Take necessary precautions to transport metalwork to the site such that it is not scratched, scraped, dented, bent or deformed.
- .2 Erect metalwork square, plumb, straight, true and accurately fitted. Support and protect metalwork in such position until concrete is set or fastening method is cured or finalized.
- .3 Ensure metal intersections and joints are tight and flush.
- .4 Finish field welds, rivets, bolts and burnt or scratched surfaces after completion of installation to NOMMA standards specified in this Section. Apply appropriate primer and apply paint with colour, appearance and thickness to match powder coating. Damaged surfaces determined to be unacceptable for on-site repair shall be removed and re-coated at the powder coating shop
- .5 Thoroughly clean surfaces of exposed metal work when installation is complete.

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#### 1.0 **GENERAL**

.1 Section 32 15 51 - S refers to those portions of the work that are unique to the construction of off-road trails in non-urban areas, including the following RDCO trail classifications:

- .1 Type 1 Major Multi-use
- .2 Type 2 Standard Multi-use
- .3 Type 3 Narrow Multi-use
- .4 Type 4 Nature
- .5 Type 5 Wilderness
- .2 This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- .3 This document contains Supplementary Specifications to the Master Municipal Contract Documents (MMCD) Specifications. and is to be applied in conjunction with Volume II of the Master Municipal Contact Documents (MMCD) Specifications, 2009 Platinum Edition
- .4 The provisions of the Supplementary Specifications supplement or supersede the provisions of the MMCD Specifications. Where the provisions of the Supplementary Specifications conflict with the MMCD Specifications the provisions of the Supplementary Specifications take precedence.
- .5 Section and article numbers in the Supplementary Specifications coincide with those of MMCD Specifications, except where the MMCD Specifications do not include those sections or article numbers.

#### 1.1 **Related Work**

.1	Environmental Protection	Section 01 57 01
.2	Metal Fabrication	Section 05 50 00-S
.3	Shrub and Tree Preservation	Section 31 11 41
.4	Clearing and Grubbing	Section 31 11 01
.5	Cast-in-Place Concrete	Section 03 30 53
.6	Geosynthetics	Section 31 32 19
.7	Fences & Gates	Section 32 31 00-S
8.	Retaining Walls	Section 32 32 00-S
.9	Fabricated Stairs	Section 32 33 00-S
.10	Fabricated Bridges	Section 32 34 00-S
.11	Structures	Section 32 36 00-S
.12	Pipe Culverts	Section 33 42 13

#### 1.2 **Quality Control**

- .1 A carpenter with a minimum of 5 years experience is required for all wood construction on off-road trail infrastructure
- .2 Assessment and falling of hazard trees shall only be undertaken by arbourist certified by International Society of Arboriculture.

#### 1.3 Submittals

.1 Safety Management System: Prior to start of construction

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### OFF-ROAD TRAILS

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- submit a Safety Management System for project in accordance with requirements of WorkSafeBC.
- .2 Pre-construction Survey: Submit survey of proposed alignment of trail prior to start of construction.
- .3 As-constructed Survey: Submit survey of as-built alignment and structures of trail upon completion of construction.
- .4 Product Data Sheets: Submit product data sheet for approval for expansive mortar, grout mix, adhesives and preservatives proposed for project. Allow minimum 5 days for review prior to ordering product.
- .5 Shop Drawings: Submit Shop Drawings for proposed changes to Contract Drawings and for protective barriers, warning devices, signs and detours.
- .6 Concrete: Submit proposed concrete mix and method of concrete placement and curing. Allow minimum 5 days for review prior to ordering concrete.
- .7 Granular Surfacing: Submit minimum 2.0kg sample of proposed granular surfacing material. Allow minimum 5 days for review prior to granular surfacing.

### 1.4 Safety

- .1 Conform to the requirements of the Workers Compensation Act, WorkSafeBC, and occupational health and safety regulations.
- .2 Maintain safe public access for trail users on detour routes and trails designated to remain open during construction.
- .3 Conduct hazard tree assessment. Remove trees, snags and limbs of hazard trees.
- .4 Install and maintain protective barriers and remove potentially hazardous rock and debris, as required to prevent material falling or encroaching on to adjacent property, improvements, natural landscape and trails during the Work.
- .5 Install and maintain protective barriers, warning devices, signs and detours during the work to protect the public and provide public access and use. Maintain until Substantial Performance.

# 1.5 Environmental Protection

- .1 Undertake fire hazard mitigation where Contractor equipment, vehicles or tools are driven, parked or operated.
- .2 Obtain copy of environmental approval documents, and terms and conditions thereof, from Contract Administrator. Keep copy of documents on site for duration of Contract.
- .3 Maintain spill kit and fire fighting kit on site for duration of

construction.

- .4 Work in accordance with terms and conditions of approval granted to the project by the approving agency having jurisdiction over the Work.
- .5 Be responsible for cost of fines, monitoring, protection, remediation and repair of the environment and the Work resulting from non-compliance with legislation, regulations and terms and conditions of environmental approval.
- .6 Burial of rubbish and waste materials on site not permitted. Disposal of volatile materials such as paints, stains or wood preservatives on site or into watercourses prohibited. Remove all non-native rubbish and waste materials from site and dispose of legally.
- .7 Maintain temporary erosion and pollution control features installed under this Contract until Total Performance, or until advised to remove by Contract Administrator.
- .8 Prevent damage to all adjacent natural growth, landscaping, buildings, structures, roads, trails and underground and overhead utilities. Make good all damage to satisfaction of Contract Administrator.
- .9 Access site by route indicated on Contract Drawings. Access to and form site by other routes without prior approval of Contract Administrator not permitted. Restore access routes on the way out as a condition of Substantial Performance.

# 1.6 Project Signs

- .1 Prepare Shop Drawing of signs, barricades and warning devices required for Work and submit to Contract Administrator for approval. Meet with Contract Administrator prior to and during Work to review and amend Shop Drawings as required.
- .2 Prior to commencement of construction provide and maintain signs, barricades and warning devices as follows:
  - .1 To provide project identification
  - .2 To communicate location and duration of project
  - .3 To indicate project related detours, closures, construction activities or other temporary and unusual conditions resulting from project work which may require trail user response
  - .4 To ensure the safety and protection of the public and the environment
- .3 Project identification sign supplied by Owner and installed and maintained by Contractor. All other signs, barricades and warning devices supplied, installed and maintained by Contractor.

- .4 Use machine produced signs of sufficient quality to withstand exposure to weather for duration of Contract.
- .5 Check and maintain signs, barricades and warning devices for repair, legibility, suitability and location daily. Remove, relocate and provide new signs, barricades and miscellaneous warning devices as work or site conditions change and as public response changes.
- .6 Make changes to signs, barricades and warning devices to ensure environmental protection, public safety and when and as directed by Contract Administrator.
- .7 Remove and dispose of signs, barricades and miscellaneous warning devices upon issuance of Certificate of Total Performance. Remove project identification sign and return to Owner.

# 1.7 Measurement and Payment

- .1 Payment for off-road trails will be made by separate item for each type and width. Payment includes all labour, materials and equipment for complete construction of trail as shown on Contract Drawings and Detail Drawings.
- .2 Payment for stairs, steps, landings, fences, barriers, signs, posts, culverts, waterbars and trail structures will be made by separate item for each type and size. Payment includes all labour, materials, equipment and incidental items for complete construction of trail structure as shown on Contract Drawings and Detail Drawings.
- .3 Payment for layout, clearing, grubbing, pruning, excavation, embankment, compaction, stripping native organic soil and site clean up will be incidental to payment for work described in this Section unless shown otherwise in the Schedule of Quantities and Unit Prices.
- .4 Payment for removal of bedrock includes all labour, materials and equipment to remove the rock as specified in this Section. Location and verification of quantity of rock removal to be determined by surveys or by agreement of Contractor and Contract Administrator. Payment for removal of loose rock will be incidental to the work described in this Section.
- .5 Costs of bonds, insurance, Workers Compensation contribution, superintendence, overhead, profits and other incidentals will be deemed to have been included in pay items of Schedule of Quantities and Prices. No payment will be made for unauthorized work or work beyond limits shown on Contract Drawings.

### 2.0 PRODUCTS

# 2.1 Native Mineral Soil

- .1 Any workable soil free of organic or foreign matter located within limits of Contract and deemed by the Contract Administrator to be native material for purposes of Contract.
- .2 Native mineral soil is not acceptable if it is impractical to control its water content or if the material is slippery, sinks, deforms or moves laterally under the weight of loads intended for the trail.

# 2.2 Native Organic Soil

.1 Any surface soil with a minimum of 4% organic matter content for clay loams and 2% for sand loams, to a maximum of 20% by volume, located within limits of Contract and deemed by the Contract Administrator to be native organic soil for purposes of Contract.

# 2.3 Pit Run Fill

.1 Well-graded granular material, substantially free from clay lumps, organic matter and other extraneous material, screened to remove all stones in excess of 200mm.

# 2.4 Granular Base

.1 25mm minus crushed gravel conforming to following gradations:

Sieve Size	Passing
(mm)	(%)
25	100
19	80-100
9.5	60-90
4.75	35-70
2.36	25-50
1.18	15-35
0.300	5-20
0.075	2-8

# 2.5 Select Granular Subbase

.1 Well graded granular material substantially free from lumps and organic mater, screened if required to conform to following gradations:

Sieve Size	Passing
(mm)	(%)
150	100
100	85-100
50	65-100
19	40-100
4.75	20-70
0.150	0-20
0.075	0-8

# 2.6 Granular Surfacing

.1 Well-graded crusher chip or reject screenings, approved by Contract Administrator.

RDCO PARKS SUPPLEMENTARY SPECIFICATION		SECTION 32 15 00 - S OFF-ROAD TRAILS PAGE 6 OF 15 2015
2.7	Asphalt	.1 As specified in Supplementary Specifications.
2.8	Expansive Mortar	.1 Non-explosive expansive mortar or grout specifically formulated for fracturing rock.
		.2 Submit Shop Drawing of expansive mortar to Contract Administrator for review and approval prior to use.
2.9	Culvert	.1 Refer to MMCD Specification 33 42 13, Clause 2.1 or Clause 2.3.
2.10	Lumber & Timber	.1 Timber: All wood steps, treads, posts and rails to be rough sawn lumber unless specified otherwise on the Contract Drawings.
		.2 Lumber: All handrails, benches, tables and other wood components intended for human contact to be be #1 Construction Grade softwood dressed, kiln-dried to 19% moisture content, conforming to CSA 0141-1970 for nominal size.
		.3 Lumber and timber dimensions shown on Contract Drawings are nominal dimensions unless specifically dimensioned.
		.4 All lumber and timber to be straight, free of splits, warps, checks, large knots or other defects, sawn straight, square and true.
		.5 Glued end-jointed lumber is not acceptable.
		.6 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122
		.7 Lumber and timber products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structure requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.
2.11	Hardware and Fastenings	.1 Nails, Spikes and Staples: conform to CSA B111 and to the size and weight indicated on Contract Drawings.
		.2 All nails to be hot-dipped galvanized and minimum 10d common nails UNO minimum 0.128" (3.25mm) shank diameter
		.3 Bolts, Screws, Washers, Lag Bolts, Nuts and Dowels: conform to CSA B-22 Series and to the size and weight indicated on Contract Drawings.

Contract Drawings.

.4 All thru-bolts and lag bolts to be hot-dipped galvanized, complete with hot-dipped galvanized washers and nuts where applicable.

RDCO PARKS SUPPLEMENTARY SPECIFICATION			OFF-ROAD TRAILS	SECTION 32 15 00 - S PAGE 7 OF 15 2015
		.5	All hardware and fittings for exterior a dipped galvanized, to CAN/CSA-G164	
2.12	Rock Anchor	.1	Rock anchor to be stainless steel or he Prepare and submit Shop Drawing of redesign to Contract Administrator for rev	ock anchor material and
2.13	Reinforcing Steel	.1	Reinforcing bar to conform to CAN/C3 to approved shop drawings or Contract	
		.2	Steel wire ties to conform to CSA G30.	3.
		.3	Deformed steel wire fabric to CSA G30	).14.
		.4	Welded steel wire fabric to conform to	CSA G30.5.
		.5	Welded deformed steel wire fabric to de Provide in flat sheets only.	conform to CSA G30.15.
		.6	Reinforcing steel to be clean and unda	maged.
2.14	Wood Preservative	.1	Pressure treated: use water borne sa Wolman CCA to an average net retent	
		.2	Vacuum impregnated: to +4XCSA average net retention of 0.8kg/m³ by copper arsenate (ACA) or chromated of	y assay of ammoniacal
		.3	Dry wood after treatment to maximum	25% moisture content.
		.4	Surface applied preservative: copp pentachlorophenol solution, water repe	
2.15	Concrete	.1	The concrete products specified herei any structural facilities such as build walls or similar structure requiring engineering design. Refer to specific on Contract Drawings.	dings, bridges, retaining site specific structural
		.2	Mixed Concrete: Refer to MMCD Specin-Place Concrete.	cification 03 30 53, Cast-
		.3	Precast Concrete: Refer to MMCD Services Precast Concrete.	Specification 03 40 01,
		.4	Sack Concrete: Pre-mixed all-purposed of Portland cement, sand 387 and a minimum 28 day compress Approved sack concrete includes "Quapproved equal. Quick setting co "Quikcrete Post Haste", by Target approval of Contract Administrator.	and stone to ASTM C- sive strength of 25 MPa. Quikcrete" by Target, or procrete mix, such as

RDCO PARKS SUPPLEMENTARY SPECIFICATION				SECTION 32 15 00 - S PAGE 8 OF 15 2015
2.16	Silt Barrier Fence	.1	Refer to MMCD Specification 01 57 01,	Clause 1.2.3.
2.17	Geosynthetics	.1	Refer to MMCD Specification 31 32 19,	Clause 2.1.
2.18	Expanded Aluminum Mesh	.1	16 standard gauge aluminum sheet provide a strand thickness of .05" and dimension of 0.5" x 1.2".	
3.0	EXECUTION			
3.1	Layout	.1	Establish survey controls and benchm Total Performance. Stake property I setbacks located within 20m of propos Maintain until Total Performance.	ines, easements and
			Layout trail within property lines and ea as shown on Contract Drawings to ach as follows:  1 All trails: 2% maximum for trail landing intersections, staging areas, entrance seating areas and less than 1/2 of the slope  2 Type 1 (Major Multi-use): 8% maximum.  3 Type 2 (Standard Multi-use): 8% maximum for short distance or approved by Contract Administrator.  4 Type 3 (Narrow Multi-use): 15% maximum pedestrians only; exceptions as apple Administrator.  5 Type 4 (Nature): 25% maximum gene maximum for short distance or between approved by Contract Administrator.  6 Type 5 (Wilderness): 25% maximum maximum for short distance or between approved by Contract Administrator.	ieve longitudinal grade ings, nodes, ies, viewpoints and e slope of the side um; ximum generally; up to between landings, as kimum for trails used in for trails used by roved by Contract erally; up to 35% een landings, as generally; up to 35% een landings, as
		.3	Layout trail to follow flattest possible gr possible cut and fill.	ade and produce least
		.4	Avoid rock, trees, drainage routes, en	vironmentally sensitive

- .4 Avoid rock, trees, drainage routes, environmentally sensitive areas or features and hazardous conditions.
- .5 Align trail on uphill side of tree possible.
- .6 Stake proposed alignment of trail, steps, stairs and other trail structures with wood stakes at minimum 20m spacing.
- .7 Survey proposed trail alignment and property lines to confirm that trail is within properties and easements indicated on Contract Drawings.

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### OFF-ROAD TRAILS

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- .8 Review proposed trail alignment and grading on site with Contract Administrator. Make adjustments to alignment as directed or approved by Contract Administrator. Confirm trees, vegetation and site features to be protected.
- .9 Re-stake proposed trail alignment at 10m spacing. Stake closer as required to clearly indicate changes in grade or alignment.
- .10 Review proposed trail alignment and grading on site with Contract Administrator and make final adjustments to alignment as directed or approved by Contract Administrator.
- .11 When alignment is finalized install offset stakes and maintain until Total Performance.
- .12 Changes to trail layout to be approved by Contract Administrator.

# 3.2 Clearing, Grubbing and Pruning

- .1 Cut off shrubs and surface vegetation within clearance zone of trail to maximum height of 50mm above ground.
- .2 Grub out stumps and roots within the tread width of trail and under stairs, boardwalk and bridge.
- .3 Prune branches and limbs within clearance zone of trail by cutting off where branch or limb meets main stem or trunk of tree or shrub.
- .4 Where specified, chip or mulch and spread cleared, grubbed and pruned materials on site.
- .5 Do not spread cleared and grubbed material in concentrated piles or groups. Scatter materials where and as approved by Contract Administrator.

# 3.3 Stripping Native Organic Soil

- .1 Strip duff and native organic soil and materials from surface and temporarily stockpile or uniformly spread on disturbed ground not exceeding 100mm depth.
- .2 Do not handle native organic soil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

# 3.4 Trail Excavation, Embankment and Compaction

- .1 Excavate full bench cut so that subgrade of trail rests on undisturbed cut earth, not backfilled soil, except where:
  - .1 The natural slope perpendicular to trail alignment is greater than 3H:1V%, or
  - .2 The natural slope is so steep that the cut face exceeds 1.8m height, or
  - .3 Where the trail is on the downhill side of a tree to be protected, or

- .4 Where the trail traverses a talus slope or loose rock, or
- .5 Where embankment fill, subgrade, subbase and base aggregate are mechanically compacted to the density specified on Contract Drawings, or
- .6 Where indicated otherwise on Contract Drawings. or
- .7 Where directed or approved otherwise by Contract Administrator.
- .2 Make adjustments to horizontal and vertical alignment of trail as necessary and as approved by the Contract Administrator to balance earthworks and produce desired trail alignment, profile and cross section.
- .3 Conserve and use all suitable material for specified work. Do not use imported soil, aggregate or rock except as indicated on Contract Drawings, Supplementary Specifications or directed by Contract Administrator.
- .4 Excavate in-situ material and use excavated materials and other suitable material as embankment fill to provide subgrade alignments, profiles and cross sections shown on Contract Drawings.
- .5 Excavate mucky and chronically moist soils to a depth of 200mm and replace with 150mm thickness loose rock and 50mm native mineral soil and compact to provide a firm, uniform subgrade surface.
- .6 If during excavation material appearing to conform to classification as bedrock, loose rock or unsuitable soil is encountered, notify Contract Administrator in sufficient time to enable pre-excavation measurements to be made to determine material quantities.
- .7 Establish grade for cut and fill slopes at a maximum slope of 1:1 and based on local soil conditions, rainfall and plant cover.
- .8 Round off top of embankment shoulders and remove loose soil, rocks, boulders, logs and other debris that may fall onto trail. Grade cut slope to provide uniform surface free of tool marks. Trim exposed roots flush with soil surface.
- .9 Widen subgrade in order to provide a finished trail tread that is 20% wider than specified where, in opinion of Contract Administrator, sloughing and erosion is likely to occur that will erode material onto or away from the finished trail.
- .10 Place excess and unsuitable excavated material on the downslope side of the trail and spread to a depth not exceeding 100mm, including any material removed in the grubbing and stripping operations and deposited in the same area. Do not block drainage routes or group material in piles, berms or windrows.

- .11 For narrow trails on steep slopes use rocks or logs to help support embankment or subgrade of trail as required.
- .12 For construction through talus and steeply sloping loose rock construct subgrade by placing fill on downhill side of trail rather than by excavating material from uphill side of trail. Place largest loose rocks along outside edge of fill embankment to support embankment and trail. Arrange outside rock with widest dimension of rock aligned horizontally. Fill inner portion of embankment with smaller loose rock in lifts no more than 2 times the diameter of the loose rock fill. Fill voids in lift with mineral soil. Tamp loose rock and mineral soil down to provide stable embankment.
- .13 Except as indicated otherwise on Contract Drawings or directed otherwise by Contract Administrator slope subgrade 2% toward downhill edge of trail.
- .14 Construct cross drains, water bars and culverts at locations approved by Contract Administrator.
- .15 Proof roll, compact or hand tamp subgrade of trail as shown on Contract Drawings only under suitable conditions. Do not proof roll, compact or hand tamp when subgrade soils are frozen or excessively wet or dry.
- .16 Place stripped native organic soil and rake smooth.

#### 3.5 Rock Removal

- .1 Rock removal refers to the removal of loose rock and bedrock rock necessary to achieve the alignment and grade of the trail and trail structures.
- .2 Loose rock is defined as talus, cobbles, boulders, unconsolidated rock rubble and rock loosely attached to bedrock that can be knocked free of bedrock using hand tools. Bedrock is defined as consolidated in-situ rock firmly attached to the rock below and beside it that cannot be knocked free using hand tools.
- .3 Remove loose rock larger than 50mm maximum dimension from base and surface materials of trail tread by hand, shovel, mattock, pick, prybar, scale bar or other tool or equipment.
- .4 Remove protruding bedrock from trail tread from trail surface as directed by Contract Administrator, using prybar, pick, jackhammer, rock drill, expansive mortar or other tool, equipment or compound.
- .5 Scale and remove loose rock from rock face on uphill side of trail as directed by Contract Administrator, by hand, shovel, mattock, pick, prybar, scale bar or other tool or equipment.
- .6 Use excavator, jack hammer, rock drill and expansive mortar

to fracture bedrock for excavation, except as specified otherwise in Contract Documents or approved by Contract Administrator.

- .7 Follow manufacturer's instructions for use of expansive mortar.
- .8 Place rock and rock fragments which may slide or roll into excavation or onto trail on down slope side of trail. Brace, bury or secure rock so it does not roll onto trails, structures or private property below. Do not block drainage routes or group rock in piles, berms or windrows.
- .9 Use excavated rock on site as backfill, trail edging or slope reinforcement. Place larger rocks at bottom and outside edge of embankment with widest dimension of rock aligned horizontally.
- .10 Dispose of surplus excavated rock on site where and as approved by Contract Administrator.

# 3.6 Trail Surfacing

- .1 For earthen trails finish trail bed with native mineral soil. Fill voids and cut high points to provide uniform surface. Establish cross slope as shown on Contract Drawings. Proof roll, compact or hand-tamp native mineral soil to provide smooth, firm surface.
- .2 For aggregate trails place and compact aggregate base and surface layers as shown on Contract Drawings. Except as indicated otherwise on Contract Drawings or directed otherwise by Contract Administrator, slope subgrade 2% toward downhill edge of trail.
- .3 Place and proof roll, compact or hand-tamp aggregate to provide smooth, uniform and firm surface.

# 3.7 Cross Drain

- .1 Construct cross drain at low point or other site along trail where, in the opinion of Contract Administrator, erosion of trail by surface water can be expected to occur.
- .2 Confirm and stake location of cross drain with Contract Administrator prior to establishing final subgrade.
- .3 Excavate existing material from cross drain location to provide grade, profile and cross section shown on Contract Drawings. Do not over excavate material.
- .4 Spread excavated material over subgrade of trail on either side of cross drain and compact or place on down slope side of trail. Do not obstruct drainage routes.
- .5 Compact fill on downstream side of cross drain and along route of drainage water, to limit of embankment

### 3.8 Water Bar

.1 Construct water bar where directed by Contract Administrator. Confirm and stake location of water bar with Contract Administrator prior to establishing final subgrade.

- .2 Excavate existing material from water bar to provide alignment, grade and cross section shown on Contract Drawings. Extend excavation to provide outfall along route of drainage water.
- .3 Drill holes in timber for anchoring pins.
- .4 Cut, wrap and press expanded aluminum mesh flush to face of timber and secure as shown in Contract Drawings.
- .5 Place timber on prepared subgrade.
- .6 Secure timber to underlying subgrade with pins as shown on Contract Drawings. Drive in pins so they do not protrude above grade of timber.
- .7 Place and compact materials in excavation around timber and along route of outfall as shown on Contract Drawings.
- .8 Compact fill downstream of outfall and along route of drainage water to limit of embankment.

### 3.9 Culvert

- .1 Confirm location and elevations of culvert on site with Contract Administrator and stake prior to excavation, trenching or placement of culvert.
- .2 Refer to MMCD Specification 33 42 13.

### 3.10 Rough Carpentry

- .1 Conform all timber work to requirements to CAN/CSA-086-01, including CAN/CSA-086S1-05.
- .2 Select and arrange exposed timber and lumber for appearance. Install materials so that grade-marks and other defacing marks are concealed.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length. Do not splice to achieve required member length.
- .5 Install timber and lumber with crown edge up.
- .6 Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed. Space uniformly.
- .7 Allow additional post height for adjustment of horizontal members in the event that post bases are not installed at exact, equal elevations.

- .8 Install cross bridging and blocking required, maximum 2400mm on centre, unless otherwise noted on Contract Drawings.
- .9 Cut and test fit posts, risers, stringers, beams and rails before securing in place. Trim and plane as necessary to achieve secure, plumb, level and flush joints.
- .10 Where not specified elsewhere in Contract Documents, all nails, spikes, wood screws and lag bolts to be of sufficient length to penetrate to at least half the depth of the second member being connected.
- .11 Make adjustments as necessary to ensure plumb posts, level treads and flush joints free of movement or settling.
- .12 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .13 Pre-drill lag bolt connections to minimum 6mm (1/4") less than diameter of lag bolt.
- .14 Pre-drill machine and carriage bolt connections to 1.5mm  $\binom{1}{16}$ ") larger diameter than bolt connector. Arrange bolt/nut assemblies so that nut is in location that is less visible and less accessible than bolt head.
- .15 Do not allow nuts and bolt heads or ends to protrude beyond surface of walking surfaces and handrail assemblies. Countersink to allow bolt or screw head and washer assembly to tighten to between flush and no more than 6mm (1/4") beneath member surface.
- .16 Make all connections tight without overly distorting or compressing wood surfaces or countersink borings. Do not reduce thickness of structural member by over-boring the countersink.
- .17 Ensure rails seating surfaces are beaded, planed and sanded smooth and free of burrs, splinters and rough spots.
- .18 Apply paint or stain finish as indicated on Contract Drawings and specified in Supplementary Specifications.
- .19 Remove and disposed of unused timber.

## 3.11 Crib Stairs

- .1 Use crib stairs where generally shown on Contract Drawings and as required to meet slope requirements of trail and where existing soil material is capable of supporting crib stairs.
- .2 Layout and adjust horizontal and vertical alignment of steps as necessary and as approved by the Contract Administrator to balance earthworks and produce the desired trail alignment,

profile and cross section.

- .3 Confirm alignment, quantity, tread depth and location and elevation of top and bottom steps before excavating.
- .4 Layout and install steps level and plumb. Space uniformly.
- .5 Construct steps starting with bottom step. Construct one step at a time.
- .6 Except as approved by Contract Administrator excavate subgrade for steps using hand tools only.
- .7 Excavate to desired subgrade for each crib individually, not as a mass excavation of the entire step or of multiple steps, so that each crib rests directly on an area of undisturbed earth slightly larger than the dimension of the timber.
- .8 Do not over excavate subgrade. Minimize excavation and disturbance of subgrade and area adjacent to steps to the minimum necessary for timber placement.
- .9 Scrape or shave earth as required to achieve a firm, level subgrade for crib stair. Fill voids with compacted mineral soil level with desired subgrade.
- .10 Adjust crib and subgrade to ensure a level, stable step free of movement or settling.
- .11 Drill holes in risers and stringers for anchoring pins. Do not drill holes for spikes.
- .12 Secure step to underlying step and subgrade with pins and spikes as shown on Contract Drawings. Drive in pins and spikes so they do not protrude above grade of step.
- .13 Place and compact surface material flush with top of step. Unless otherwise specified in Contract Drawings finish surface of crib tread with native mineral soil.
- .14 Backfill sides of completed step with native mineral soil to a point 25mm below the bottom of the leading edge of the crib riser.

RDCO PARKS SUPPLEMENTARY SPECIFICATION		FENCE & GATES	SECTION 32 31 00 - S PAGE 1 OF 7 2015
1.0	GENERAL	.1 Section 32 31 00 - S refers to those are unique to the construction of fer and gates.	
		.2 This section must be reference simultaneously with all other section described herein.	•
		.3 This document contains Supplement Master Municipal Contract Document and is to be applied in conjunction w Municipal Contact Documents (MM Platinum Edition	its (MMCD) Specifications ith Volume II of the Master
		supplement or supersede the p Specifications. Where the provision Specifications conflict with the M	ns of the Supplementary
		.5 Section and article numbers Specifications coincide with those except where the MMCD Specificat sections or article numbers.	
1.1	Related Work	<ul> <li>.1 Environmental Protection</li> <li>.2 Metal Fabrication</li> <li>.3 Cast-in-Place Concrete</li> <li>.4 Off-Road Trails</li> <li>.5 Retaining Walls</li> <li>.6 Fabricated Stairs</li> <li>.7 Fabricated Bridges</li> <li>.8 Structures</li> </ul>	Section 01 57 01 Section 05 50 00-S Section 03 30 53 Section 32 15 00-S Section 32 32 00-S Section 32 33 00-S Section 32 34 00-S Section 32 36 00-S
1.2	Quality Control	.1 A carpenter with a minimum of 5 yea undertake construction of fences, gu gates.	

to Contract Documents

regulations.

1.3

1.4

1.5

Submittals

**Environmental** 

Protection

Safety

.1 Shop Drawings: Submit Shop Drawings for proposed changes

.1 Conform to the requirements of the Workers Compensation

.1 Undertake fire hazard mitigation where Contractor equipment,

.2 Obtain copy of environmental approval documents, and terms and conditions thereof, from Contract Administrator. Keep

vehicles or tools are driven, parked or operated.

Act, WorkSafeBC, and occupational health and safety

copy of documents on site for duration of Contract.

- .3 Maintain spill kit and fire fighting kit on site for duration of construction.
- .4 Work in accordance with terms and conditions of approval granted to the project by the approving agency having jurisdiction over the Work.
- .5 Be responsible for cost of fines, monitoring, protection, remediation and repair of the environment and the Work resulting from non-compliance with legislation, regulations and terms and conditions of environmental approval.
- .6 Burial of rubbish and waste materials on site not permitted. Disposal of volatile materials such as paints, stains or wood preservatives on site or into watercourses prohibited. Remove all non-native rubbish and waste materials from site and dispose of legally.
- .7 Prevent damage to all adjacent natural growth, landscaping, buildings, structures, roads, trails and underground and overhead utilities. Make good all damage to satisfaction of Contract Administrator.

# 1.6 Measurement and Payment

.1 Payment for fences, guardrails, handrails and gates will be made by a separate item for each type and size. Payment includes all labour, materials, equipment and incidental items for complete construction of trail structure as shown on Contract Drawings and Detail Drawings.

### 2.0 PRODUCTS

### 2.01 Lumber & Timber

- .1 Timber: All wood posts and rails to be rough cut Douglas Fir-L #2 or better unless specified otherwise on the Contract Drawings.
- .2 Lumber: All guardrails, handrails and other wood components intended for human contact to be be #1 Construction Grade softwood dressed, kiln-dried to 19% moisture content, conforming to CSA 0141-1970 for nominal size.
- .3 Lumber and timber dimensions shown on Contract Drawings are nominal dimensions unless specifically dimensioned.
- .4 All lumber and timber to be straight, free of splits, warps, checks, large knots or other defects, sawn straight, square and true.
- .5 Glued end-jointed lumber is not acceptable.
- .6 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122
- .7 Lumber and timber products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structure requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.

# 2.11 Hardware and Fastenings

- .1 Nails, Spikes and Staples: conform to CSA B111 and to the size and weight indicated on Contract Drawings.
- .2 All nails to be hot-dipped galvanized and minimum 10d common nails UNO minimum 0.128" (3.25mm) shank diameter
- .3 Bolts, Screws, Washers, Lag Bolts, Nuts and Dowels: conform to CSA B-22 Series and to the size and weight indicated on Contract Drawings.
- .4 All thru-bolts and lag bolts to be hot-dipped galvanized, complete with hot-dipped galvanized washers and nuts where applicable.
- .5 All hardware and fittings for exterior application hot to be hotdipped galvanized, to CAN/CSA-G164.

# 2.12 Rock Anchor

.1 Rock anchor to be stainless steel or hot-dip galvanized steel. Prepare and submit Shop Drawing of rock anchor material and design to Contract Administrator for review and approval.

# 2.13 Reinforcing Steel

.1 Reinforcing bar to conform to CAN/CSA-G30.18-[M92]. Refer to approved shop drawings or Contract Drawings for size.

RDCO PARKS SUPPLEMENTARY SPECIFICATION	FENCE & GATES	Section 32 31 00 - S Page 4 of 7 2015
	2 Stool wire ties to conform to CSA	C30 3

- .2 Steel wire ties to conform to CSA G30.3.
- .3 Deformed steel wire fabric to CSA G30.14.
- .4 Welded steel wire fabric to conform to CSA G30.5.
- .5 Welded deformed steel wire fabric to conform to CSA G30.15. Provide in flat sheets only.
- .6 Reinforcing steel to be clean and undamaged.

### 2.14 Wood Preservative

- .1 Pressure treated: use water borne salt preservative equal to Wolman CCA to an average net retention on 6.4kg/m³
- .2 Vacuum impregnated: to +4XCSA O80 Series-97. **to average net retention of 0.8kg/m³ by assay of ammoniacal copper arsenate (ACA) or chromated copper arsenate (CCA)
- .3 Dry wood after treatment to maximum 25% moisture content.
- .4 Surface applied preservative: copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

### 2.15 Concrete

- .1 The concrete products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structure requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.
- .2 Mixed Concrete: Refer to MMCD Specification 03 30 53, Castin-Place Concrete.
- .3 Precast Concrete: Refer to MMCD Specification 03 40 01, Precast Concrete.
- .4 Sack Concrete: Pre-mixed all-purpose dry concrete mix composed of Portland cement, sand and stone to ASTM C-387 and a minimum 28 day compressive strength of 25 MPa. Approved sack concrete includes "Quikcrete" by Target, or approved equal. Quick setting concrete mix, such as "Quikcrete Post Haste", by Target, permitted only with approval of Contract Administrator.

# 3.0 EXECUTION

### 3.01 Rough Carpentry

- .1 Conform all timber work to requirements to CAN/CSA-086-01, including CAN/CSA-086S1-05.
- .2 Select and arrange exposed timber and lumber for appearance. Install materials so that grade-marks and other defacing marks are concealed.

- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length. Do not splice to achieve required member length.
- .5 Install timber and lumber with crown edge up.
- .6 Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed. Space uniformly.
- .7 Allow additional post height for adjustment of horizontal members in the event that post bases are not installed at exact, equal elevations.
- .8 Install cross bridging and blocking required, maximum 2400mm on centre, unless otherwise noted on Contract Drawings.
- .9 Cut and test fit posts, risers, stringers, beams and rails before securing in place. Trim and plane as necessary to achieve secure, plumb, level and flush joints.
- .10 Where not specified elsewhere in Contract Documents, all nails, spikes, wood screws and lag bolts to be of sufficient length to penetrate to at least half the depth of the second member being connected.
- .11 Make adjustments as necessary to ensure plumb posts, level treads and flush joints free of movement or settling.
- .12 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .13 Pre-drill lag bolt connections to minimum 6mm (1/4") less than diameter of lag bolt.
- .14 Pre-drill machine and carriage bolt connections to 1.5mm  $(^1/_{16}$ ") larger diameter than bolt connector. Arrange bolt/nut assemblies so that nut is in location that is less visible and less accessible than bolt head.
- .15 Do not allow nuts and bolt heads or ends to protrude beyond surface of walking surfaces and handrail assemblies. Countersink to allow bolt or screw head and washer assembly to tighten to between flush and no more than 6mm (1/4") beneath member surface.
- .16 Make all connections tight without overly distorting or compressing wood surfaces or countersink borings. Do not reduce thickness of structural member by over-boring the

			countersink.
		.17 Ensure rails seating surfaces are beaded, planed and sanded smooth and free of burrs, splinters and rough spots.	
		.18	Apply paint or stain finish as indicated on Contract Drawings and specified in Supplementary Specifications.
		.19	Remove and disposed of unused timber.
3.02	Guardrail	.1	Supply and install guardrail as shown in Supplemental Details and indicated in Contract Documents
3.03	Timber Bollard	.1	Supply and install timber bollard as shown in Supplemental Details and indicated Contract Drawings
3.04	Split Rail Fence	.1	Supply and install split rail fence as shown in Supplemental Details and indicated in Contract Documents
3.05	Field Fence	.1	Supply and install field fence as shown in Supplemental Details and indicated in Contract Documents
3.06	3 Rail Fence	.1	Supply and install 3 rail fence as shown in Supplemental Details and indicated in Contract Documents
3.07	Timber Handrail	.1	Supply and install timber handrail as shown in Supplemental Details and indicated in Contract Documents
3.08	Aluminum Handrail	.1	Supply and install aluminum handrail as shown in Supplemental Details and indicated in Contract Documents
3.08	Guardrail and Handrail Footings	.1	Supply and install guardrail footing as shown in Supplemental Details and indicated in Contract Documents
		.2	Supply and install handrail footing as shown in Supplemental Details and indicated in Contract Documents
3.09	User Baffle	.1	Supply and install user baffle as shown in Supplemental Details and indicated in Contract Documents
3.10	Maintenance Gate	.1	Supply and install maintenance gate as shown in Supplemental Details and indicated in Contract Documents
3.11	Vehicle Gate	.1	Supply and install vehicle gate as shown in Supplemental Details and indicated in Contract Documents
3.12	Greenway Gate	.1	Supply and install vehicle gate as shown in Supplemental Details and indicated in Contract Documents
3.13	Reinforcing Steel	.1	Cut reinforcing steel to length necessary to meet intent of Contract Drawings. Field bend reinforcing steel without heat, applying a slow and steady pressure.

- .2 Place reinforcing steel as shown on Contract Drawings and in accordance with CAN/CSA-A23.1. Tie reinforcing steel in place 75mm clear from earth and 50mm clear from all formwork.
- .3 Use reinforcing steel bars or mesh where shown on Contract Drawings and in concrete volumes greater than 0.2m³ that do not have reinforcement
- .4 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing material and placement.

# 3.14 Cast-in-Place Concrete

- .1 Formwork to conform to shape, lines and dimensions shown on Contract Drawings.
- .2 Formwork to be substantial, sufficiently tight to prevent leakage of mortar and braced and tied to maintain position and shape.
- .3 Formwork to be unlined unless specified otherwise.
- .4 Install formwork for footing.
- .5 Prior to placing concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing.
- .6 Pumping of concrete is permitted only after Contract Administrator's approval of pumping equipment and concrete mix.
- .7 Ensure reinforcement, inserts and bracing are undisturbed during concrete placement until concrete cured.
- .8 Protect exposed surfaces and inserts from vandalism and from hot and cold weather per CAN/CSA-A23.1-04 during initial set period.
- .9 Ensure reinforcements and inserts are undisturbed during concrete placement until concrete cured.
- .10 Place and compact concrete to CAN/CSA-A23.1 and to approval of Contract Administrator.
- .11 Strip and dispose exposed forms, ensuring no damage to concrete.
- .12 Do not place load upon new concrete until authorized by Contract Administrator.

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### 1.0 GENERAL

- .1 Section 32 32 00 S refers to those portions of the work that are unique to the construction of retaining walls and in non-urban areas and related to trail infrastructure:
- .2 This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- .3 This document contains Supplementary Specifications to the Master Municipal Contract Documents (MMCD) Specifications, and is to be applied in conjunction with Volume II of the Master Municipal Contact Documents (MMCD) Specifications, 2009 Platinum Edition
- .4 The provisions of the Supplementary Specifications supplement or supersede the provisions of the MMCD Specifications. Where the provisions of the Supplementary Specifications conflict with the MMCD Specifications the provisions of the Supplementary Specifications take precedence.
- .5 Section and article numbers in the Supplementary Specifications coincide with those of MMCD Specifications, except where the MMCD Specifications do not include those sections or article numbers.

# 1.1 Related Work

.1	Environmental Protection	Section 01 57 01
.2	Cast-in-Place Concrete	Section 03 30 53
.3	Metal Fabrication	Section 05 50 00-S
.4	Clearing and Grubbing	Section 31 11 01
.5	Geosynthetics	Section 31 32 19
.6	Gabions	Section 31 36 13
.7	Off-Road Trails	Section 32 15 00-S
.8	Fences & Gates	Section 32 31 00-S

# 1.2 Quality Control

- .1 Construction of timber retaining walls shall only be undertaken by a carpenter holding a BC Certificate of Qualification.
- .2 Construction of gabion retaining walls shall only be undertaken by a certified gabion installer.

### 1.3 Submittals

- .1 Safety Management System: Prior to start of construction submit a Safety Management System for project in accordance with requirements of WorkSafeBC.
- .2 Carpenter's Certification: Submit copy of carpenter's BC Certificate of Qualification.
- .3 Shop Drawings: Submit Shop Drawings from Gabion Wall system manufacturer for approval prior to installation of retaining wall

RDCO PARKS SUPPLEMENTARY SPECIFICATION		SE RETAINING WALLS	SECTION 32 32 00 - S PAGE 2 OF 6 2015
1.4	Safety	.1 Conform to the requirements of the Worke Act, WorkSafeBC, and occupational her regulations.	
1.5	Environmental Protection	.1 Undertake fire hazard mitigation where Contivehicles or tools are driven, parked or operate	
		.2 Obtain copy of environmental approval documents and conditions thereof, from Contract Additional copy of documents on site for duration of Contract Additional copy of documents on site for duration of Contract Additional copy of documents on site for duration of Contract Additional copy of the copy	ministrator. Keep
		.3 Maintain spill kit and fire fighting kit on sit construction.	e for duration of
		.4 Work in accordance with terms and condit granted to the project by the approving jurisdiction over the Work.	
		.5 Be responsible for cost of fines, monitor remediation and repair of the environment resulting from non-compliance with legislation terms and conditions of environmental approx	t and the Work n, regulations and
		.6 Burial of rubbish and waste materials on single Disposal of volatile materials such as paints preservatives on site or into watercourses prall non-native rubbish and waste material dispose of legally.	s, stains or wood ohibited. Remove
		.7 Prevent damage to all adjacent natural grow buildings, structures, roads, trails and u overhead utilities. Make good all damage Contract Administrator.	nderground and

# 1.6 Measurement and Payment

.1 Payment for retaining will be made by separate item for each type and face meter. Payment includes all labour, materials, equipment and incidental items for complete construction of trail structure as shown on Contract Drawings.

### 2.0 PRODUCTS

### 2.01 Lumber & Timber

- .1 Timber: All wood steps, treads, posts and rails to be rough sawn lumber unless specified otherwise on the Contract Drawings.
- .2 Lumber: All handrails, benches, tables and other wood components intended for human contact to be be #1 Construction Grade softwood dressed, kiln-dried to 19% moisture content, conforming to CSA 0141-1970 for nominal size.
- .3 Lumber and timber dimensions shown on Contract Drawings are nominal dimensions unless specifically dimensioned.
- .4 All lumber and timber to be straight, free of splits, warps, checks, large knots or other defects, sawn straight, square and true.
- .5 Glued end-jointed lumber is not acceptable.
- .6 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122
- .7 Lumber and timber products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structure requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.

# 2.02 Hardware and Fastenings

- .1 Nails, Spikes and Staples: conform to CSA B111 and to the size and weight indicated on Contract Drawings.
- .2 All nails to be hot-dipped galvanized and minimum 10d common nails UNO minimum 0.128" (3.25mm) shank diameter
- .3 Bolts, Screws, Washers, Lag Bolts, Nuts and Dowels: conform to CSA B-22 Series and to the size and weight indicated on Contract Drawings.
- .4 All thru-bolts and lag bolts to be hot-dipped galvanized, complete with hot-dipped galvanized washers and nuts where applicable.
- .5 All hardware and fittings for exterior application hot to be hot-dipped galvanized, to CAN/CSA-G164.

# 2.03 Reinforcing Steel

- .1 Reinforcing bar to conform to CAN/CSA-G30.18-[M92]. Refer to approved shop drawings or Contract Drawings for size.
- .2 Steel wire ties to conform to CSA G30.3.
- .3 Deformed steel wire fabric to CSA G30.14.

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- .4 Welded steel wire fabric to conform to CSA G30.5.
- .5 Welded deformed steel wire fabric to conform to CSA G30.15. Provide in flat sheets only.
- .6 Reinforcing steel to be clean and undamaged.

## 2.04 Wood Preservative

- .1 Pressure treated: use water borne salt preservative equal to Wolman CCA to an average net retention on 6.4kg/m³
- .2 Vacuum impregnated: to +4XCSA O80 Series-97. **to average net retention of 0.8kg/m³ by assay of ammoniacal copper arsenate (ACA) or chromated copper arsenate (CCA)
- .3 Dry wood after treatment to maximum 25% moisture content.
- .4 Surface applied preservative: copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

### 2.05 Gabions

.1 Refer to MMCD Specification 31 36 13, Clause 2.1.

# 2.06 Geosynthetics

.2 Refer to MMCD Specification 31 32 19, Clause 2.1.

# 3.0 EXECUTION

# 3.01 Rough Carpentry

- .1 Conform all timber work to requirements to CAN/CSA-086-01, including CAN/CSA-086S1-05.
- .2 Select and arrange exposed timber and lumber for appearance. Install materials so that grade-marks and other defacing marks are concealed.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length. Do not splice to achieve required member length.
- .5 Install timber and lumber with crown edge up.
- .6 Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed. Space uniformly.
- .7 Allow additional post height for adjustment of horizontal members in the event that post bases are not installed at exact, equal elevations.
- .8 Install cross bridging and blocking required, maximum 2400mm on centre, unless otherwise noted on Contract

Drawings.

- .9 Cut and test fit posts, risers, stringers, beams and rails before securing in place. Trim and plane as necessary to achieve secure, plumb, level and flush joints.
- .10 Where not specified elsewhere in Contract Documents, all nails, spikes, wood screws and lag bolts to be of sufficient length to penetrate to at least half the depth of the second member being connected.
- .11 Make adjustments as necessary to ensure plumb posts, level treads and flush joints free of movement or settling.
- .12 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .13 Pre-drill lag bolt connections to minimum 6mm (1/4") less than diameter of lag bolt.
- .14 Pre-drill machine and carriage bolt connections to 1.5mm  $(^1/_{16}$ ") larger diameter than bolt connector. Arrange bolt/nut assemblies so that nut is in location that is less visible and less accessible than bolt head.
- .15 Do not allow nuts and bolt heads or ends to protrude beyond surface of walking surfaces and handrail assemblies. Countersink to allow bolt or screw head and washer assembly to tighten to between flush and no more than 6mm (1/4") beneath member surface.
- .16 Make all connections tight without overly distorting or compressing wood surfaces or countersink borings. Do not reduce thickness of structural member by over-boring the countersink.
- .17 Ensure rails seating surfaces are beaded, planed and sanded smooth and free of burrs, splinters and rough spots.
- .18 Apply paint or stain finish as indicated on Contract Drawings and specified in Supplementary Specifications.
- .19 Remove and disposed of unused timber.

# 3.02 Timber Retaining Walls

- .1 Use timber retaining where shown on Contract Drawings and as required to meet side slope requirements of proposed trail.
- .2 Grade area to receive timber retaining to elevations, lines and grades shown on Contract Drawings
- .3 Fill depressions with approved material and compact
- .4 Place filter and/or geotextile material, if required, on prepared

RDCO PARKS SUPPLEMENTARY SPECIFICATION			RETAINING WALLS	SECTION 32 32 00 - S PAGE 6 OF 6 2015
			surface as shown on the Contract Docu	ıments
		.5	Install timber retaining walls to lines shown on Contract Drawings.	grades and heights as
3.03	Gabion Retaining Walls	.1	Use gabion retaining where shown on as required to meet side slope requirem	
		.2	Grade area to receive gabion retaining grades shown on Contract Drawings	to elevations, lines and
		.3	Fill depressions with approved material	and compact
		.4	Place filter and/or geotextile material, i surface as shown on the Contract Docu	
		.5	Supply and install gabion retaining Supplemental Details and indicated in Co	
		.6	Refer to MMCD Specification 31 3 installation instructions.	6 13, Clause 3.0 for
3.04	Dry Stack Retaining Walls	.1	Use dry stack retaining where shown and as required to meet side slope rectrail.	
		.2	Grade area to receive gabion retaining grades shown on Contract Drawings	to elevations, lines and
		.3	Fill depressions with approved material	and compact
		.4	Place filter and/or geotextile material, i surface as shown on the Contract Docu	

.5 Supply and install dry stack retaining wall as shown in Supplemental Details and indicated in Contract Documents

RDCO PARKS SUPPLEMENTARY SPECIFICATION		SECTION 32 33 00 - S FABRICATED TIMBER STAIRS PAGE 1 OF 8 2015
1.0	GENERAL	.1 Section 32 32 00 - S refers to those portions of the work tha are unique to the construction of fabricated timber stairs landings, bases and connections in non-urban areas and related to trail infrastructure:
		.2 This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
		.3 This document contains Supplementary Specifications to the Master Municipal Contract Documents (MMCD) Specifications and is to be applied in conjunction with Volume II of the Maste Municipal Contact Documents (MMCD) Specifications, 2009 Platinum Edition
		.4 The provisions of the Supplementary Specifications supplement or supersede the provisions of the MMCE Specifications. Where the provisions of the Supplementary Specifications conflict with the MMCD Specifications the provisions of the Supplementary Specifications take precedence.
		.5 Section and article numbers in the Supplementary Specifications coincide with those of MMCD Specifications except where the MMCD Specifications do not include those sections or article numbers.
1.1	Related Work	.1 Environmental Protection  .2 Metal Fabrication  .3 Cast-in-Place Concrete  .4 Fences & Gates  Section 01 57 01  Section 05 50 00-S  Section 03 30 53  Section 32 31 00-S
1.2	Quality Control	.1 Construction of fabricated timber stairs shall only be undertaken by a carpenter holding a BC Certificate of Qualification.
1.3	Submittals	.1 Carpenter's Certification: Submit copy of carpenter's BC Certificate of Qualification.
		.2 Shop Drawings: Submit Shop Drawings for all metal brackets

.2 Shop Drawings: Submit Shop Drawings for all metal brackets and anchor manufacturer for approval prior to installation of stairs

# 1.4 Safety

.1 Conform to the requirements of the Workers Compensation Act, WorkSafeBC, and occupational health and safety regulations.

# 1.5 Environmental Protection

.1 Undertake fire hazard mitigation where Contractor equipment, vehicles or tools are driven, parked or operated.

- .2 Obtain copy of environmental approval documents, and terms and conditions thereof, from Contract Administrator. Keep copy of documents on site for duration of Contract.
- .3 Maintain spill kit and fire fighting kit on site for duration of construction.
- .4 Work in accordance with terms and conditions of approval granted to the project by the approving agency having jurisdiction over the Work.
- .5 Be responsible for cost of fines, monitoring, protection, remediation and repair of the environment and the Work resulting from non-compliance with legislation, regulations and terms and conditions of environmental approval.
- .6 Burial of rubbish and waste materials on site not permitted. Disposal of volatile materials such as paints, stains or wood preservatives on site or into watercourses prohibited. Remove all non-native rubbish and waste materials from site and dispose of legally.
- .7 Prevent damage to all adjacent natural growth, landscaping, buildings, structures, roads, trails and underground and overhead utilities. Make good all damage to satisfaction of Contract Administrator.

# 1.6 Measurement and Payment

.1 Payment for fabricated timber stairs, landings, and bases will be made for each type and by the quantity of each individual component. Payment includes all labour, materials, equipment and incidental items for complete construction of trail structure as shown on Contract Drawings.

### 2.0 PRODUCTS

#### 2.01 Lumber & Timber

- .1 Timber: All wood steps, treads, posts and rails to be rough sawn lumber unless specified otherwise on the Contract Drawings.
- .2 Lumber: All handrails, benches, tables and other wood components intended for human contact to be be #1 Construction Grade softwood dressed, kiln-dried to 19% moisture content, conforming to CSA 0141-1970 for nominal size.
- .3 All concealed joists treated with a wood preservative as per Section 2.05.
- .4 Lumber and timber dimensions shown on Contract Drawings are nominal dimensions unless specifically dimensioned.
- .5 All lumber and timber to be straight, free of splits, warps, checks, large knots or other defects, sawn straight, square and true.
- .6 Glued end-jointed lumber is not acceptable.
- .7 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122 to be fabricated by a plant conforming to CSA 0177-M89 (R2003).
- .8 Lumber and timber products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structures requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.

# 2.02 Hardware and Fastenings

- .1 Nails, Spikes and Staples: conform to CSA B111 and to the size and weight indicated on Contract Drawings.
- .2 All nails to be hot-dipped galvanized and minimum 10d common nails UNO minimum 0.128" (3.25mm) shank diameter
- .3 Bolts, Screws, Washers, Lag Bolts, Nuts and Dowels: conform to CSA B-22 Series and to the size and weight indicated on Contract Drawings.
- .4 All thru-bolts and lag bolts to be hot-dipped galvanized, complete with hot-dipped galvanized washers and nuts where applicable.
- .5 All hardware and fittings for exterior application hot to be hotdipped galvanized, to CAN/CSA-G164.

### 2.03 Rock Anchor

.1 Rock anchor to be stainless steel or hot-dip galvanized steel. Prepare and submit Shop Drawing of rock anchor material and

RDCO PARKS SUPPLEMENTARY SPECIFICATION		SECTION 32 33 00 - S FABRICATED TIMBER STAIRS PAGE 4 OF 8 2015
		design to Contract Administrator for review and approval.
2.04	Reinforcing Steel	.1 Reinforcing bar to conform to CAN/CSA-G30.18-M92 (R2002 Grade 400. Refer to approved shop drawings or Contrac Drawings for size.
		.2 Steel wire ties to conform to CSA G30.3.
		.3 Deformed steel wire fabric to CSA G30.14.
		.4 Welded steel wire mesh to conform to CSA G30.5-M1983 (R1998).
		.5 Welded deformed steel wire fabric to conform to CSA G30.15 Provide in flat sheets only.
		.6 Reinforcing steel to be clean and undamaged.
2.05	Wood Preservative	.1 Pressure treated: use water borne salt preservative equal to Wolman CCA to an average net retention on 6.4kg/m³
		.2 Vacuum impregnated: to +4XCSA O80 Series-97. **to average net retention of 0.8kg/m³ by assay of ammoniaca copper arsenate (ACA) or chromated copper arsenate (CCA)
		.3 Dry wood after treatment to maximum 25% moisture content.
		.4 Surface applied preservative: copper napthenate or 5% pentachlorophenol solution, water repellent preservative.
2.06	Concrete	.1 The concrete products specified herein are not to be used fo any structural facilities such as buildings, bridges, retaining walls or similar structures requiring site specific structural engineering design. Refer to specific design criterial specified on Contract Drawings.
		.2 Mixed Concrete: Refer to MMCD Specification 03 30 53, Cast

- .2 Mixed Concrete: Refer to MMCD Specification 03 30 53, Castin-Place Concrete.
- .3 Precast Concrete: Refer to MMCD Specification 03 40 01, Precast Concrete.
- .4 Sack Concrete: Pre-mixed all-purpose dry concrete mix composed of Portland cement, sand and stone to ASTM C-387 and a minimum 28 day compressive strength of 25 MPa. Approved sack concrete includes "Quikcrete" by Target, or approved equal. Quick setting concrete mix, such as "Quikcrete Post Haste", by Target, permitted only with approval of Contract Administrator.
- .5 All concrete work shall comply with the requirements of CSA Standard A23.3-04 (R2010). Concrete strengths to be verified by independent tests to CSA-A23. At the expense of the

Contractor, a minimum of 3 tests cylinders shall be cast for each 100 cubic meters or each days pour, whichever is less, with copies submitted to the Engineer.

# 3.0 EXECUTION

# 3.01 Rough Carpentry

- .1 Conform all timber work to requirements to CAN/CSA-086-09.
- .2 Select and arrange exposed timber and lumber for appearance. Install materials so that grade-marks and other defacing marks are concealed.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length. Do not splice to achieve required member length.
- .5 Install timber and lumber with crown edge up.
- .6 Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed. Space uniformly.
- .7 Allow additional post height for adjustment of horizontal members in the event that post bases are not installed at exact, equal elevations.
- .8 Install cross bridging and blocking required, maximum 2400mm on centre, unless otherwise noted on Contract Drawings.
- .9 Cut and test fit posts, risers, stringers, beams and rails before securing in place. Trim and plane as necessary to achieve secure, plumb, level and flush joints, without compromising the structural integrity of the member.
- .10 Where not specified elsewhere in Contract Documents, all nails, spikes, wood screws and lag bolts to be of sufficient length to penetrate to at least half the depth of the second member being connected.
- .11 Make adjustments as necessary to ensure plumb posts, level treads and flush joints free of movement or settling.
- .12 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .13 Lag screws shall be pre-drilled with a bit size of 65% of the shank diameter for the threaded portion. Lead holes shall be the same length as the unthreaded portion and the same

- diameter as the shank. Screw all lags into place. Cut washers shall be provided under heads which bear on wood.
- .14 Pre-drilled machine and carriage bolt connections must not exceed 1.5mm  $(^1/_{16}$ ") larger diameter than bolt connector. Arrange bolt/nut assemblies so that nut is in location that is less visible and less accessible than bolt head.
- .15 Do not allow nuts and bolt heads or ends to protrude beyond surface of walking surfaces and handrail assemblies. Countersink to allow bolt or screw head and washer assembly to tighten to between flush and no more than 6mm (1/4") beneath member surface.
- .16 Make all connections tight without overly distorting or compressing wood surfaces or countersink borings. Do not reduce thickness of structural member by over-boring the countersink.
- .17 Ensure rails seating surfaces are beaded, planed and sanded smooth and free of burrs, splinters and rough spots.
- .18 Apply paint or stain finish as indicated on Contract Drawings and specified in Supplementary Specifications.
- .19 Remove and disposed of unused timber.

### 3.02 Timber Stairs

- .1 Use timber stairs where generally shown on Contract Drawings and as required to meet slope requirements of trail.
- .2 Layout and adjust horizontal and vertical alignment of stairs and landings as necessary and as approved by the Contract Administrator to respond to site conditions and produce the desired stair alignment and location of landings.
- .3 Confirm stair alignment and location and elevation of landings and top and bottom steps before excavating or setting posts.
- .4 Maintain consistent rise:run relationship of steps for entire length of staircase. Maintain consistent tread width and tred length. Maintain consistent handrail height. Maintain consistent guardrail height.
- .5 Excavate hole for footing as shown on Contract Drawings. Minimize excavation and disturbance of subgrade and area adjacent to footings to the minimum necessary for construction of staircase.
- .6 If bedrock is encountered before required depth is achieved prepare and submit Shop Drawing showing method proposed for securing footing to bedrock and timber to footing.
- .7 Countersink all bolts on inside of handrails.

### 3.03 Rock Anchors

.1 Use rock drill to excavate hole in bedrock for rock anchor. Maximum diameter of hole to be twice the diameter of anchor steel. Size and depth of anchor steel shown on approved Shop Drawings. Secure in place with approved grout or adhesive according to manufacturer's instructions.

# 3.04 Reinforcing Steel

- .1 Cut reinforcing steel to length necessary to meet intent of Contract Drawings. Field bend reinforcing steel without heat, applying a slow and steady pressure.
- .2 Place reinforcing steel as shown on Contract Drawings and in accordance with CAN/CSA-A23.1 or CSA-A23.4, as applicable. Tie reinforcing steel in place 75mm clear from earth and 40mm clear from all formwork, unless as noted on Contract Drawings.
- .3 Use reinforcing steel bars or mesh where shown on Contract Drawings and in concrete volumes greater than 0.2m³ that do not have reinforcement
- .4 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing material and placement.

# 3.05 Cast-in-Place Concrete

- .1 The Contractor is responsible for the design of all formwork and shoring and for complying with all Workers' Compensation Board Regulations, pertaining to formwork construction, design and inspection. Formwork and shoring shall be designed by a professional Engineer registered in the province of British Columbia.
- .2 Formwork to conform to shape, lines and dimensions shown on Contract Drawings.
- .3 Formwork to be substantial, sufficiently tight to prevent leakage of mortar and braced and tied to maintain position and shape.
- .4 Formwork to be unlined unless specified otherwise.
- .5 Install formwork for footing.
- .6 Prior to placing concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing.
- .7 Pumping of concrete is permitted only after Contract Administrator's approval of pumping equipment and concrete mix.
- .8 Ensure reinforcement, inserts and bracing are undisturbed during concrete placement and until the concrete has adequately cured, as per Contract Drawings.

RDCO PARKS SUPPLEMENTARY SPECIFICATION	FABRICATED TIMBER STAIRS	SECTION 32 33 00 - S PAGE 8 OF 8 2015
	.9 Protect exposed surfaces and inserts for hot and cold weather per CAN/CSA-A2 period.	
	.10 Mix, place, compact and cure concre CAN/CSA-A23.1 or CSA-A23.4, as apply of Contract Administrator.	
	.11 Strip and dispose exposed forms, e concrete.	nsuring no damage to
	.12 Do not place load upon new concre Contract Administrator.	ete until authorized by

# 3.06 Guardrail

.1 Supply and install guardrail as shown in Supplemental Details and indicated in Contract Documents

# 3.07 Handrail

.1 Supply and install handrail as shown in Supplemental Details and indicated in Contract Documents

RDCO PARKS SUPPLEMENTARY SPECIFICATION		Section 32 34 00 - S FABRICATED BRIDGES PAGE 1 OF 9 2015
1.0	GENERAL	.1 Section 32 34 00 - S refers to those portions of the work tha are unique to the construction of fabricated bridges boardwalks, footings, abutments and connections in non-urbar areas and related to trail infrastructure:
		.2 This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
		.3 This document contains Supplementary Specifications to the Master Municipal Contract Documents (MMCD) Specifications and is to be applied in conjunction with Volume II of the Maste Municipal Contact Documents (MMCD) Specifications, 2009 Platinum Edition
		.4 The provisions of the Supplementary Specifications supplement or supersede the provisions of the MMCD Specifications. Where the provisions of the Supplementary Specifications conflict with the MMCD Specifications the provisions of the Supplementary Specifications take precedence.
		.5 Section and article numbers in the Supplementary Specifications coincide with those of MMCD Specifications except where the MMCD Specifications do not include those sections or article numbers.
1.1	Related Work	.1 Environmental Protection  .2 Metal Fabrication  .3 Cast-in-Place Concrete  .4 Fences & Gates  Section 01 57 01  Section 05 50 00-S  Section 03 30 53  Section 32 31 00-S
1.2	Quality Control	.1 Construction of fabricated bridges shall only be undertaken by a carpenter holding a BC Certificate of Qualification.
1.3	Submittals	.1 Safety Management System: Prior to start of construction submit a Safety Management System for project in accordance with requirements of WorkSafeBC.
		.2 Carpenter's Certification: Submit copy of carpenter's BC Certificate of Qualification.
		.3 Shop Drawings: Submit Shop Drawings from Gabion Wal

retaining wall

# 1.4 Safety

.1 Conform to the requirements of the Workers Compensation Act, WorkSafeBC, and occupational health and safety regulations.

# 1.5 Environmental

.1 Undertake fire hazard mitigation where Contractor equipment,

### Protection

vehicles or tools are driven, parked or operated.

- .2 Obtain copy of environmental approval documents, and terms and conditions thereof, from Contract Administrator. Keep copy of documents on site for duration of Contract.
- .3 Maintain spill kit and fire fighting kit on site for duration of construction.
- .4 Work in accordance with terms and conditions of approval granted to the project by the approving agency having jurisdiction over the Work.
- .5 Be responsible for cost of fines, monitoring, protection, remediation and repair of the environment and the Work resulting from non-compliance with legislation, regulations and terms and conditions of environmental approval.
- .6 Burial of rubbish and waste materials on site not permitted. Disposal of volatile materials such as paints, stains or wood preservatives on site or into watercourses prohibited. Remove all non-native rubbish and waste materials from site and dispose of legally.
- .7 Prevent damage to all adjacent natural growth, landscaping, buildings, structures, roads, trails and underground and overhead utilities. Make good all damage to satisfaction of Contract Administrator.

# 1.6 Measurement and Payment

.1 Payment for fabricated bridges and boardwalks will be a lump sum for the entire component. Payment includes all labour, materials, equipment and incidental items for complete construction of bridge or boardwalk structure as shown on Contract Drawings.

### 2.0 PRODUCTS

### 2.01 Lumber & Timber

- .1 Timber: All wood steps, treads, posts and rails to be rough sawn lumber unless specified otherwise on the Contract Drawings.
- .2 Lumber: All handrails, benches, tables and other wood components intended for human contact to be be #1 Construction Grade softwood dressed, kiln-dried to 19% moisture content, conforming to CSA 0141-1970 for nominal size.
- .3 All concealed joists treated with a wood preservative as per Section 2.05.
- .4 Lumber and timber dimensions shown on Contract Drawings are nominal dimensions unless specifically dimensioned.
- .5 All lumber and timber to be straight, free of splits, warps, checks, large knots or other defects, sawn straight, square and true.
- .6 Glued end-jointed lumber is not acceptable.
- .7 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122 to be fabricated by a plant conforming to CSA 0177-M89 (R2003).
- .8 Lumber and timber products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structures requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.

### 2.02 Hardware and Fastenings

- .1 Nails, Spikes and Staples: conform to CSA B111 and to the size and weight indicated on Contract Drawings.
- .2 All nails to be hot-dipped galvanized and minimum 10d common nails UNO minimum 0.128" (3.25mm) shank diameter
- .3 Bolts, Screws, Washers, Lag Bolts, Nuts and Dowels: conform to CSA B-22 Series and to the size and weight indicated on Contract Drawings.
- .4 All thru-bolts and lag bolts to be hot-dipped galvanized, complete with hot-dipped galvanized washers and nuts where applicable.
- .5 All hardware and fittings for exterior application hot to be hotdipped galvanized, to CAN/CSA-G164.

RDCO PARKS SUPPLEMENTARY SPECIFICATION		FABRICATED BRIDGES	Section 32 34 00 - S Page 4 of 9 2015
2.03	Reinforcing Steel		to CAN/CSA-G30.18-M92 (R2002) roved shop drawings or Contrac
		.2 Steel wire ties to conform to	CSA G30.3.
		.3 Deformed steel wire fabric to	o CSA G30.14.
		.4 Welded steel wire fabric t (R1998).	to conform to CSA G30.5-M1983
		.5 Welded deformed steel wire Provide in flat sheets only.	e fabric to conform to CSA G30.15
		.6 Reinforcing steel to be clear	n and undamaged.
2.04 Wood Preservativ	Wood Preservative	.1 Pressure treated: use wate Wolman CCA to an average	er borne salt preservative equal to e net retention on 6.4kg/m³
		average net retention of 0	+4XCSA O80 Series-97. **to 0.8kg/m³ by assay of ammoniaca hromated copper arsenate (CCA)
		.3 Dry wood after treatment to	maximum 25% moisture content.
		• • • • •	tive: copper napthenate or 5% water repellent preservative.
2.05 Concrete		specific structural engineeri	ridges and boardwalks require site ing design and specifiaction. Refer secified on Contract Drawings.
		.2 Mixed Concrete: Refer to M in-Place Concrete.	IMCD Specification 03 30 53, Cast-
		.3 Precast Concrete: Refer to Precast Concrete.	o MMCD Specification 03 40 01
		composed of Portland cem 387 and a minimum 28 day Approved sack concrete in approved equal. Quick	d all-purpose dry concrete mixnent, sand and stone to ASTM Concrete, compressive strength of 25 MPa includes "Quikcrete" by Target, or setting concrete mix, such as by Target, permitted only with istrator.
		Standard A23.3-04 (R2010) by independent tests to C Contractor. A minimum of	nply with the requirements of CSA). Concrete strengths to be verified CSA-A23. At the expense of the f 3 test cylinders shall be cast for each days pour whichever is less

each 100 cubic meters or each days pour, whichever is less, with copies submitted to the Engineer.

### 3.0 EXECUTION

### 3.01 Rough Carpentry

- .1 Conform all timber work to requirements to CAN/CSA-086-09.
- .2 Select and arrange exposed timber and lumber for appearance. Install materials so that grade-marks and other defacing marks are concealed.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length. Do not splice to achieve required member length.
- .5 Install timber and lumber with crown edge up.
- .6 Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed. Space uniformly.
- .7 Allow additional post height for adjustment of horizontal members in the event that post bases are not installed at exact, equal elevations.
- .8 Install cross bridging and blocking required, maximum 2400mm on centre, unless otherwise noted on Contract Drawings.
- .9 Cut and test fit posts, risers, stringers, beams and rails before securing in place. Trim and plane as necessary to achieve secure, plumb, level and flush joints, without compromising the structure integrity of the member.
- .10 Where not specified elsewhere in Contract Documents, all nails, spikes, wood screws and lag bolts to be of sufficient length to penetrate to at least half the depth of the second member being connected.
- .11 Make adjustments as necessary to ensure plumb posts, level treads and flush joints free of movement or settling.
- .12 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .13 Lag screws shall be pre-drilled with a bit size of 65% of the shank diameter for the threaded portion. Lead holes shall be the same length as the unthreaded portion and the same diameter as the shank. Screw all lags into place. Cut washers shall be provided under heads which bear on wood.
- .14 Pre-drilled machine and carriage bolt connections must not

- exceed 1.5mm  $\binom{1}{16}$ ") larger diameter than bolt connector. Arrange bolt/nut assemblies so that nut is in location that is less visible and less accessible than bolt head.
- .15 Do not allow nuts and bolt heads or ends to protrude beyond surface of walking surfaces and handrail assemblies. Countersink to allow bolt or screw head and washer assembly to tighten to between flush and no more than 6mm (1/4") beneath member surface.
- .16 Make all connections tight without overly distorting or compressing wood surfaces or countersink borings. Do not reduce thickness of structural member by over-boring the countersink.
- .17 Ensure rails seating surfaces are beaded, planed and sanded smooth and free of burrs, splinters and rough spots.
- .18 Apply paint or stain finish as indicated on Contract Drawings and specified in Supplementary Specifications.
- .19 Remove and disposed of unused timber.

### 3.02 Scalable Free Span Bridge

- .1 Supply and install scalable free span bridge as shown in Supplemental Details and indicated in Contract Documents. This work includes all bridge components.
- .2 Layout and adjust footings / abutments as necessary for the specified length of the bridge. Review with Contract Administrator to ensure the bridge responds to the site conditions and produces the desired bridge alignment.
- .3 Excavate hole for footings as shown on Contract Drawings. Minimize excavation and disturbance of subgrade and area adjacent to footings to the minimum necessary for construction of bridge.
- .4 If bedrock is encountered before required depth is achieved prepare and submit Shop Drawing showing method proposed for securing footing / abutment to bedrock.

### 3.03 Wetland Boardwalk

- .1 Supply and install wetland boardwalk as shown in Supplemental Details and indicated in Contract Documents. This work includes all boardwalk components.
- .2 Layout and adjust footings / abutments as necessary for the specified length of the boardwalk. Review with Contract Administrator to ensure the boardwalk responds to the site conditions and produces the desired alignment.
- .3 Excavate hole for footings as shown on Contract Drawings. Minimize excavation and disturbance of subgrade and area adjacent to footings to the minimum necessary for construction

of boardwalk

.4 If bedrock is encountered before required depth is achieved prepare and submit Shop Drawing showing method proposed for securing footing / abutment to bedrock.

### 3.04 Trail Boardwalk

- .1 Supply and install trail boardwalk as shown in Supplemental Details and indicated in Contract Documents. This work includes all boardwalk components.
- .2 Layout and adjust footings / abutments as necessary for the specified length of the boardwalk. Review with Contract Administrator to ensure the boardwalk responds to the site conditions and produces the desired alignment.
- .3 Excavate hole for footings as shown on Contract Drawings. Minimize excavation and disturbance of subgrade and area adjacent to footings to the minimum necessary for construction of boardwalk
- .4 If bedrock is encountered before required depth is achieved prepare and submit Shop Drawing showing method proposed for securing footing / abutment to bedrock.

### 3.05 Cast-in-Place Concrete

- .1 The contractor is responsible for the design of all formwork and shoring and for complying with all Workers' Compensation Board Regulations, pertaining to formwork construction, design and inspection. Formwork and shoring shall be designed by a professional engineer registered in the province of British Columbia.
- .2 Formwork to conform to shape, lines and dimensions shown on Contract Drawings.
- .3 Formwork to be substantial, sufficiently tight to prevent leakage of mortar and braced and tied to maintain position and shape.
- .4 Formwork to be unlined unless specified otherwise.
- .5 Install formwork for footing.
- .6 Prior to placing concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing.
- .7 Pumping of concrete is permitted only after Contract Administrator's approval of pumping equipment and concrete mix.
- .8 Ensure reinforcement, inserts and bracing are undisturbed during concrete placement and until the concrete has adequately cured as per the Contract Drawings.
- .9 Protect exposed surfaces and inserts from vandalism and from

hot and cold weather per CAN/CSA-A23.1-04 during initial set period.

- .10 Mix, place, compact, and cure concrete in accordance with CAN/CSA-A23.1 or CSA-A23.4, as applicable and to approval of Contract Administrator.
- .11 Strip and dispose exposed forms, ensuring no damage to concrete.
- .12 Do not place load upon new concrete until authorized by Contract Administrator.

### 3.06 Structural Steel

- .1 Fabrication, erection, structural design and detailing of all structural steel and connectors shall be in accordance with CSA-S16-09. Steel decking and metal studs shall be designed, fabricated and installed in accordance with CSA-S136-07 (R2012) and specifications of the manufacturer. Shop drawings for the connections shall be sealed by a qualified professional engineer registered in the province of British Columbia.
- .2 Welded shall conform to CSA W59-03 (R2008) and shall be performed by CSA certified welders. Fabrication shops shall be approved by the Canadian Welding Bureau to CSA W47.1-09. Certificates shall be supplied to the Engineer.
- .3 Structural steel shall meet CSA G40.20-04 (r2009) for general requirements and CCSA G40.21-04 (R2009) for quality.
- .4 Grades of material (unless otherwise noted)

HSS, W Shapes 350WT Class (C)
Other Structural Steel & Misc. Metals
Bolts, Nuts and Washers ASTM A325
Anchor Bolts ASTM A307

- .5 All connections shall be shop welded and field bolted unless otherwise approved. Connection shall be designed from face of the beam to columns without applying rotational loads to column.
- .6 All structural steel connections shall, unless otherwise noted, be designed by the fabricator. All fillet welds shall be minimum ¼" (6mm). All bolts shall be minimum ¾" dia. A325 (assume threads intercepted). Use a minimum of 2 bolts per connection. Design connections for the greater of the factored forces shown on the drawings or the factored end shear of 60% of total beam load.
- .7 Metric size bolts and plate products are acceptable on an equal size equal strength basis.

RDCO PARKS SUPPLEMENTARY SPECIFICATION			PAGE 9 OF 9 2015	
		.8 Pretensioning is required for all connection bolts susceptible seismic force.	to:	
		.9 Snug-tight is required where bolts are not carrying seism force according to CSA-S16-09, Table 8.	nic	
3.07	Guardrail	.1 Supply and install guardrail as shown in Supplemental Deta and indicated in Contract Documents	ails	
3.08	Handrail	.1 Supply and install handrail as shown in Supplemental Deta and indicated in Contract Documents	ails	

RDCO PARKS SUPPLEMENTARY	STRUCTURES	SECTION 32 36 00 - S PAGE 1 OF 7	
SPECIFICATION		2015	

### 1.0 GENERAL

- .1 Section 32 36 00 S refers to those portions of the work that are unique to the construction of regional park structures including comfort stations, picnic shelters, benches, kiosks, sign structures and signs.
- .2 This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- .3 This document contains Supplementary Specifications to the Master Municipal Contract Documents (MMCD) Specifications, and is to be applied in conjunction with Volume II of the Master Municipal Contact Documents (MMCD) Specifications, 2009 Platinum Edition
- .4 The provisions of the Supplementary Specifications supplement or supersede the provisions of the MMCD Specifications. Where the provisions of the Supplementary Specifications conflict with the MMCD Specifications the provisions of the Supplementary Specifications take precedence.
- .5 Section and article numbers in the Supplementary Specifications coincide with those of MMCD Specifications, except where the MMCD Specifications do not include those sections or article numbers.

### 1.1 Related Work

- .1 Environmental Protection Section 01 57 01
- .2 Cast-in-Place Concrete Section 03 30 53

### 1.2 Quality Control

- .1 A carpenter holding a BC Certificate of Qualification shall only undertake construction of comfort stations.
- .2 A carpenter with a minimum of 5 years experience is required on all other structures

### 1.3 Submittals

- .1 Safety Management System: Prior to start of construction submit a Safety Management System for project in accordance with requirements of WorkSafeBC.
- .2 Carpenter's Certification: Submit copy of carpenter's BC Certificate of Qualification if comfort stations or picnic shelters are part of the contract documents

### 1.4 Safety

.1 Conform to the requirements of the Workers Compensation Act, WorkSafeBC, and occupational health and safety regulations.

### 1.5 Environmental Protection

- .1 Undertake fire hazard mitigation where Contractor equipment, vehicles or tools are driven, parked or operated.
- .2 Obtain copy of environmental approval documents, and terms and conditions thereof, from Contract Administrator. Keep copy of documents on site for duration of Contract.
- .3 Maintain spill kit and fire fighting kit on site for duration of construction.
- .4 Work in accordance with terms and conditions of approval granted to the project by the approving agency having jurisdiction over the Work.
- .5 Be responsible for cost of fines, monitoring, protection, remediation and repair of the environment and the Work resulting from non-compliance with legislation, regulations and terms and conditions of environmental approval.
- .6 Burial of rubbish and waste materials on site not permitted. Disposal of volatile materials such as paints, stains or wood preservatives on site or into watercourses prohibited. Remove all non-native rubbish and waste materials from site and dispose of legally.
- .7 Prevent damage to all adjacent natural growth, landscaping, buildings, structures, roads, trails and underground and overhead utilities. Make good all damage to satisfaction of Contract Administrator.

### 1.6 Measurement and Payment

.1 Payment for structures will be made by separate item for each type and size. Payment includes all labour, materials, equipment and incidental items for complete construction of park structure as shown on Contract Drawings.

### 2.0 PRODUCTS

### 2.01 Lumber & Timber

- .1 Timber: All wood posts and rails to be rough cut Douglas Fir-L #2 or better unless specified otherwise on the Contract Drawings.
- .2 Lumber: All guardrails, handrails and other wood components intended for human contact to be be #1 Construction Grade softwood dressed, kiln-dried to 19% moisture content, conforming to CSA 0141-1970 for nominal size.
- .3 Lumber and timber dimensions shown on Contract Drawings are nominal dimensions unless specifically dimensioned.
- .4 All lumber and timber to be straight, free of splits, warps, checks, large knots or other defects, sawn straight, square and true.
- .5 Glued end-jointed lumber is not acceptable.
- .6 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122
- .7 Lumber and timber products specified herein are not to be used for any structural facilities such as buildings, bridges, retaining walls or similar structure requiring site specific structural engineering design. Refer to specific design criteria specified on Contract Drawings.

### 2.11 Hardware and Fastenings

- .1 Nails, Spikes and Staples: conform to CSA B111 and to the size and weight indicated on Contract Drawings.
- .2 All nails to be hot-dipped galvanized and minimum 10d common nails UNO minimum 0.128" (3.25mm) shank diameter
- .3 Bolts, Screws, Washers, Lag Bolts, Nuts and Dowels: conform to CSA B-22 Series and to the size and weight indicated on Contract Drawings.
- .4 All thru-bolts and lag bolts to be hot-dipped galvanized, complete with hot-dipped galvanized washers and nuts where applicable.
- .5 All hardware and fittings for exterior application hot to be hot-dipped galvanized, to CAN/CSA-G164.

### 2.12 Rock Anchor

.1 Rock anchor to be stainless steel or hot-dip galvanized steel. Refer to Contract Drawings for size..

### 2.13 Reinforcing Steel

- .1 Reinforcing bar to conform to CAN/CSA-G30.18-[M92]. Refer to Contract Drawings for size.
- .2 Steel wire ties to conform to CSA G30.3.

RDCO PARKS		SECTION 32 36 00 - S
SUPPLEMENTARY	STRUCTURES	Page 4 of 7
SPECIFICATION		2015

- .3 Deformed steel wire fabric to CSA G30.14.
- .4 Welded steel wire fabric to conform to CSA G30.5.
- .5 Welded deformed steel wire fabric to conform to CSA G30.15. Provide in flat sheets only.
- .6 Reinforcing steel to be clean and undamaged.

### 2.14 Wood Preservative

- .1 Pressure treated: use water borne salt preservative equal to Wolman CCA to an average net retention on 6.4kg/m³
- .2 Vacuum impregnated: to +4XCSA O80 Series-97. **to average net retention of 0.8kg/m³ by assay of ammoniacal copper arsenate (ACA) or chromated copper arsenate (CCA)
- .3 Dry wood after treatment to maximum 25% moisture content.
- .4 Surface applied preservative: copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

### 2.15 Concrete

- .1 The concrete products specified herein are only to be used for small structure footings only. All large structure requiring concrete must refer to specific design criteria specified on Contract Drawings.
- .2 Mixed Concrete: Refer to MMCD Specification 03 30 53, Castin-Place Concrete.
- .3 Precast Concrete: Refer to MMCD Specification 03 40 01, Precast Concrete.
- .4 Sack Concrete: Pre-mixed all-purpose dry concrete mix composed of Portland cement, sand and stone to ASTM C-387 and a minimum 28 day compressive strength of 25 MPa. Approved sack concrete includes "Quikcrete" by Target, or approved equal. Quick setting concrete mix, such as "Quikcrete Post Haste", by Target, permitted only with approval of Contract Administrator.

### 3.0 EXECUTION

### 3.01 Rough Carpentry

- .1 Conform all timber work to requirements to CAN/CSA-086-01, including CAN/CSA-086S1-05.
- .2 Select and arrange exposed timber and lumber for appearance. Install materials so that grade-marks and other defacing marks are concealed.
- .3 Install members true to line, levels and elevations, square and plumb.

- .4 Construct continuous members from pieces of longest practical length. Do not splice to achieve required member length.
- .5 Install timber and lumber with crown edge up.
- .6 Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed. Space uniformly.
- .7 Allow additional post height for adjustment of horizontal members in the event that post bases are not installed at exact, equal elevations.
- .8 Install cross bridging and blocking required, maximum 2400mm on centre, unless otherwise noted on Contract Drawings.
- .9 Cut and test fit posts, risers, stringers, beams and rails before securing in place. Trim and plane as necessary to achieve secure, plumb, level and flush joints.
- .10 Where not specified elsewhere in Contract Documents, all nails, spikes, wood screws and lag bolts to be of sufficient length to penetrate to at least half the depth of the second member being connected.
- .11 Make adjustments as necessary to ensure plumb posts, level treads and flush joints free of movement or settling.
- .12 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .13 Pre-drill lag bolt connections to minimum 6mm (1/4") less than diameter of lag bolt.
- .14 Pre-drill machine and carriage bolt connections to 1.5mm  $(^1/_{16}$ ") larger diameter than bolt connector. Arrange bolt/nut assemblies so that nut is in location that is less visible and less accessible than bolt head.
- .15 Do not allow nuts and bolt heads or ends to protrude beyond surface of walking surfaces and handrail assemblies. Countersink to allow bolt or screw head and washer assembly to tighten to between flush and no more than 6mm (1/4") beneath member surface
- .16 Make all connections tight without overly distorting or compressing wood surfaces or countersink borings. Do not reduce thickness of structural member by over-boring the countersink.

SUPPLEMENTARY SPECIFICATION		SECTION 32 36 00 - STRUCTURES PAGE 6 OF 20	
		.17 Ensure rails seating surfaces are bea smooth and free of burrs, splinters and	
		.18 Apply paint or stain finish as indicate and specified in Supplementary Specified	
		.19 Remove and disposed of unused timb	er.
3.02	Comfort Station	.1 Supply and install comfort station as Details and indicated in Contract Docu	
3.03	Site Constructed Bench	.1 Supply and install site-constructed Supplemental Details and indicated in	
3.04	Sign Structures	.1 Supply and install all sign structure kiosk, lectern, pedestal, location, dir signs as shown in Supplemental D Contract Documents	ectional and blaze post
3.05	Timber Post Caps and Brackets	.1 Install all timber post caps and bracker as shown in Supplemental Details as Documents	• • •
3.06	Sign Structure Footings	.1 Supply and install all sign structure Supplemental Details and indicated in	•
3.07	Sign Frames	.1 Install all sign frames supplied by t Supplemental Details and indicated in	
3.08	Reinforcing Steel	.1 Cut reinforcing steel to length nece Contract Drawings. Field bend reinfo applying a slow and steady pressure.	
		.2 Place reinforcing steel as shown on C accordance with CAN/CSA-A23.1. place 75mm clear from earth and formwork.	Tie reinforcing steel in
		.3 Use reinforcing steel bars or mesh w Drawings and in concrete volumes gr not have reinforcement	
		.4 Prior to placing concrete, obtain of approval of reinforcing material and place.	
3.09	Cast-in-Place Concrete	.1 Formwork to conform to shape, lines on Contract Drawings.	and dimensions shown
		.2 Formwork to be substantial, suffice leakage of mortar and braced and tied shape.	

**SECTION 32 36 00 - S** 

**RDCO PARKS** 

- .3 Formwork to be unlined unless specified otherwise.
- .4 Install formwork for footing.
- .5 Prior to placing concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing.
- .6 Pumping of concrete is permitted only after Contract Administrator's approval of pumping equipment and concrete mix.
- .7 Ensure reinforcement, inserts and bracing are undisturbed during concrete placement until concrete cured.
- .8 Protect exposed surfaces and inserts from vandalism and from hot and cold weather per CAN/CSA-A23.1-04 during initial set period.
- .9 Ensure reinforcements and inserts are undisturbed during concrete placement until concrete cured.
- .10 Place and compact concrete to CAN/CSA-A23.1 and to approval of Contract Administrator.
- .11 Strip and dispose exposed forms, ensuring no damage to concrete.
- .12 Do not place load upon new concrete until authorized by Contract Administrator.

	Regional Parks Design Guidelines
	Regional Parks Design Guidelines
APPENDIX C:VISUAL IDENTITY STANDARD	S

In 2010, Regional Parks contracted a graphic designer to help create visual identity standards to be used in branding and promotional materials. The standards refer to appropriate use and layout of the Regional Parks logo, typefaces, and colours in digital and print design.


# **VISUAL IDENTITY STANDARDS MANUAL**

This manual has been compiled in order to provide you with guidelines when using the elements of the RDCO Regional Parks branding.















The RDCO Regional Parks brand is made up of 3 components:

- 1. RDCO logo and logotype
- 2. REGIONAL PARKS logotype
- 3. 'Naturally Yours' tagline

When all 3 appear together, they must be in this position relative to each other, and in this porportion.

## DO NOT reconfigure the logo elements





this position and porportion relative to each other be maintained. PARKS logotype (but not the 'Naturally Yours' tagline), the two When using the RDCO logo and logotype with the REGIONAL components should be centered, as shown. It is important that Do not reduce REGIONAL PARKS relative to the RDCO logo.

group and used separately to The 'Naturally Yours' tagline promote the Regional Parks brand, as demonstrated on can be separated from the the ball caps.

Naturally Yours' can be used in white (reversed) on darker colors and photos.





















It is important to allow space around the Regional Parks brand in all applications, including signage, print material and electronic newsletters.

A curved-top graphic shape has been created for use in conjunction with the brand elements to further add to the recognition of the Regional Parks brand across different applications and help to protect the space around the graphic elements.

Park identification signs will be constructed from natural wood, as shown, with the information carved/painted onto the wood.





DO NOT place logo directly on photos or colorful backgrounds.

Samples of how all of the elements work together to create an image that represents Regional Parks.



other elements.

Because of the number of colors in the brand, it is not

PARKS logotype have been chosen to complement the existing The colors for the 'Naturally Yours' tagline and REGIONAL palette of the Regional District of Central Okanagan logo.



C0 M70 Y100 K36

**PMS 174U** 

**PMS 174C** 

C0 M37 Y100 K23

PMS 139U

PMS 139C

It has been requested and recommended that the use of the Pantone 2755 CVC be kept to a minimum when designing supporting graphics.



FRIZ QUADRATA (TRACKING: -25) **TITLES or PARK NAMES** 

The display font for REGIONAL PARKS is taken from the RDCO

logo, in order to create harmony and consistency when working

with the components of the branding together.

Naturally Yours' has been handwritten and is, therefore, unique

to the tagline and cannot be used for other elements.

Subtitles or Display type, such as web URL Friz Quadrata (tracking: -25)

A simple font, Helvetica, has been chosen as the alternate in

order to present information in a clear, legible way.

HELVETICA for body copy of brochures or print material.

When the RDCO Regional Parks brand is used in conjunction with other logos, be sure to allow the **minimum space around** the graphic elelments (at least equal to the height of the letter 'R' in the 'Regional Parks' logotype).

Because of the small type that forms part of the original RDCO

Because of the small type that forms part of the original RDCO logo, it is important that the **minimum width** the RDCO Regional Parks logo can appear in print is 1.75" wide.





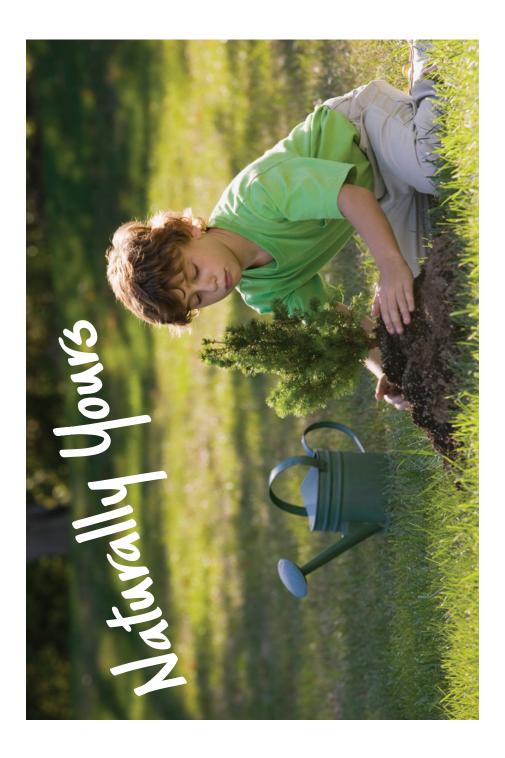


Because of the flexibility offered by separating the tagline 'Naturally Yours' from the RDCO logo/logotype and the REGIONAL PARKS logotype, the new branding can be implemented in phases.

For example, vehicles that already have the RDCO decal can be embellished with the new 'Naturally Yours' graphics, and have the REGIONAL PARKS logotype added.
























Programal Paylog Design Cuideline	20
Regional Parks Design Guideling	
APPENDIX D: REGIONAL PARKS SIGN GUIDELINES	
AFFENDIA D: REGIONAL PARKS SIGN GUIDELINES	




### Pedestal Sign Lectern Sign Blaze Post Directional Post 1-1-1 You Are Here Sign (Portrait or landscape) Kiosk **Entrance Sign**

## Parks Services Sign Collection

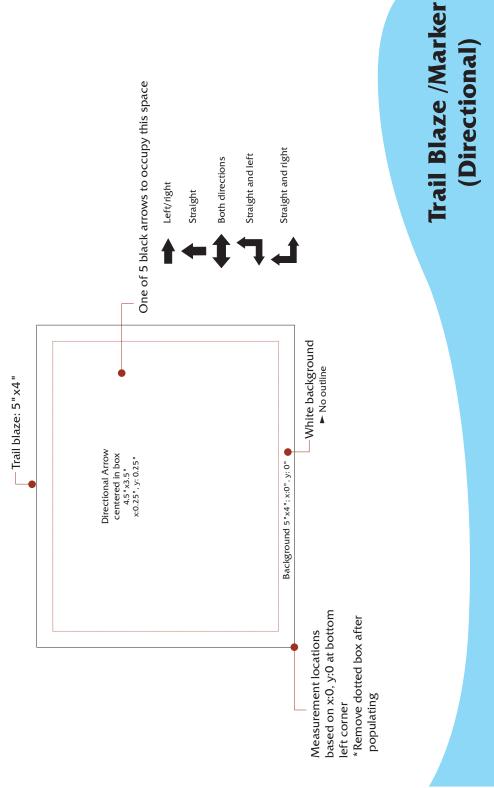
## Greenway Greenway

### Trail Blaze /Marker C:100 M: 0 Y: 100 K: 0 symbols to occupy this space C:100 M: 0 Y: 0 K: 0 C: 0 M: 0 Y: 0 K: 100 A unique colour for the trail (90° Turned) One of three trail difficulty ► No outline ▼ No outline Trail blaze: 5 "x5" Trail Blaze Colour 5"x5" x:0", y:0" Symbol 1.1"x1.1" x:3.6", y: 0.15" rail Name Tex Difficulty Parks 'swoop' graphic, in white sized to maximize space Image centered on blaze and 4.7"x1.5" x: 0.15", y: 3.35" ► 0.5pt white outline Graphic Swoop 5"x1.4" x: 0", y: 0" Logo 1.5"x0.675" x: 0.15", y: 0.15" A unique trail name (either black Yours' logo to occupy this space *Remove dotted boxes after based on x:0, y:0 at bottom RDCO Parks Services 'Naturally or white) representative of the space but not to exceed 60 pt ► Arial font, bold, to maximize in silhouette (either black or Measurement locations white) representative of the A unique graphic identifier ▼ Center justified trail and/or park populating left corner trail name

Sign Specifications:

### Yellowbell Trail Blaze /Marker C:100 M: 0 Y: 100 K: 0 symbols to occupy this space C: 0 M: 0 Y: 0 K: 100 C:100 M: 0 Y: 0 K: 0 A unique colour for the trail One of three trail difficulty PECIONAL SENS (Flat) ▼ No outline ▼ No outline -White background ▼ No outline Trail Blaze Colour 5"x5" x:0", y: 0.5" Trail blaze: 5"x6" Difficulty Symbol 1.1"x1.1" x:3.6", y: 0.65" **Trail Name Text** Background 5"x6"; x:0", y: 0" Image centered on blaze and sized to maximize space 4.7"×1.5" x: 0.15", y: 3.85" Graphic Swoop 5"x1.4" x:0", y:0.5" Parks 'swoop' graphic, in white ► 0.5pt, white outline Logo 1.5 "x0.675 " x: 0.15 ", y: 0.65 " Sign Specifications: A unique trail name (either black Yours' logo to occupy this space RDCO Parks Services 'Naturally or white) representative of the space but not to exceed 60 pt Center justified ► Arial font, bold, to maximize in silhouette (either black or white) representative of the based on x:0, y:0 at bottom A unique graphic identifier Measurement locations *Remove dotted boxes after populating trail and/or park left corner trail name

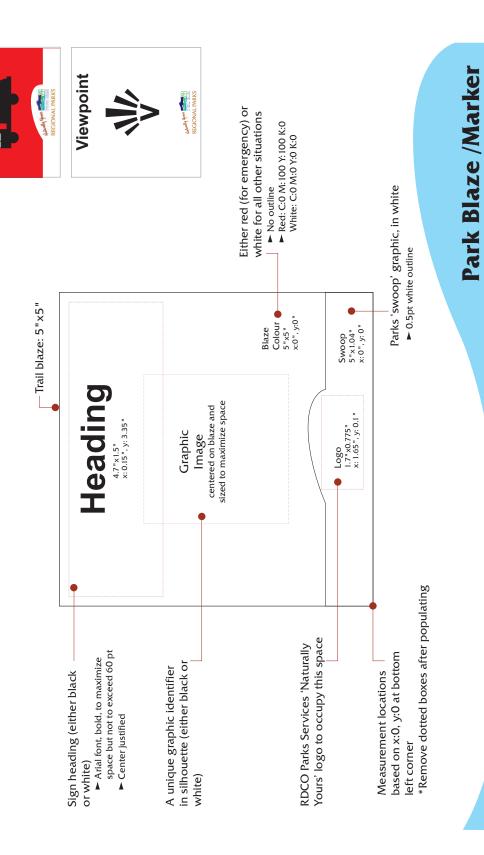
# Sign Specifications:



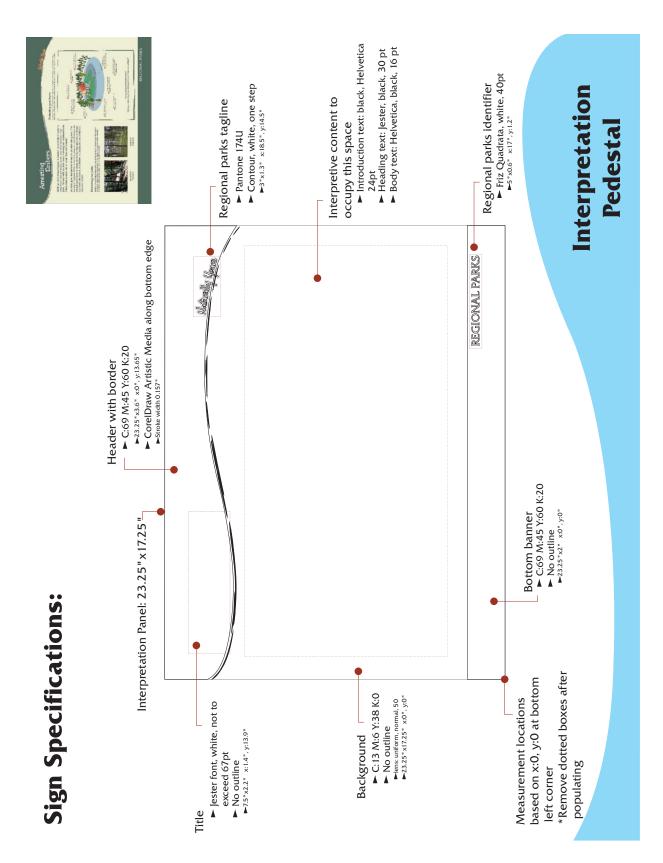
# Sign Specifications:

**Emergency** 

Access



(Non-Trail)



### Matterning (from Regional parks identifier Friz Quadrata, white, 50pt REGIONAL PARKS ► CorelDraw Artistic Media along bottom edge ► Stroke width 0.245" ► C:69 M:45 Y:60 K:20 ►47.25"x5.8" x:0", y:17.45" Header with border C:13 M:6 Y:38 K:0 No outline Fiens: uniforn, normal, 50 A7.25" x23.25" x:0", y:0" Background Interpretation Panel: 47.25 "x23.25" | Bottom banner | | C:69 M:45 Y:60 K:20 | | No outline | | 47.25*3.4* x0*,y0* Sign Specifications: ► Jester font, white, not to exceed 67pt ► No outline ►12"x3" x3.3", y:18.2" Title

► Contour, white, one step ►3.6"x1.6" x:40.6", y:19.1"

Regional parks tagline

► Pantone 174U

Heading text: Jester, black,
45 pt
Body text: Helvetica, black,
30 pt

Interpretive content to occupy this space

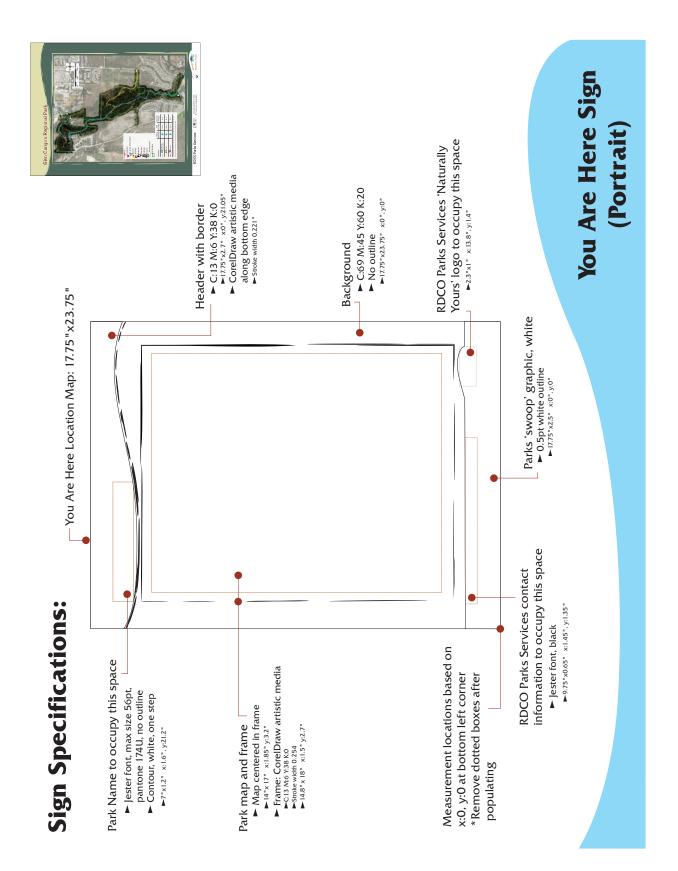
### Interpretation Lectern

*Remove dotted boxes after

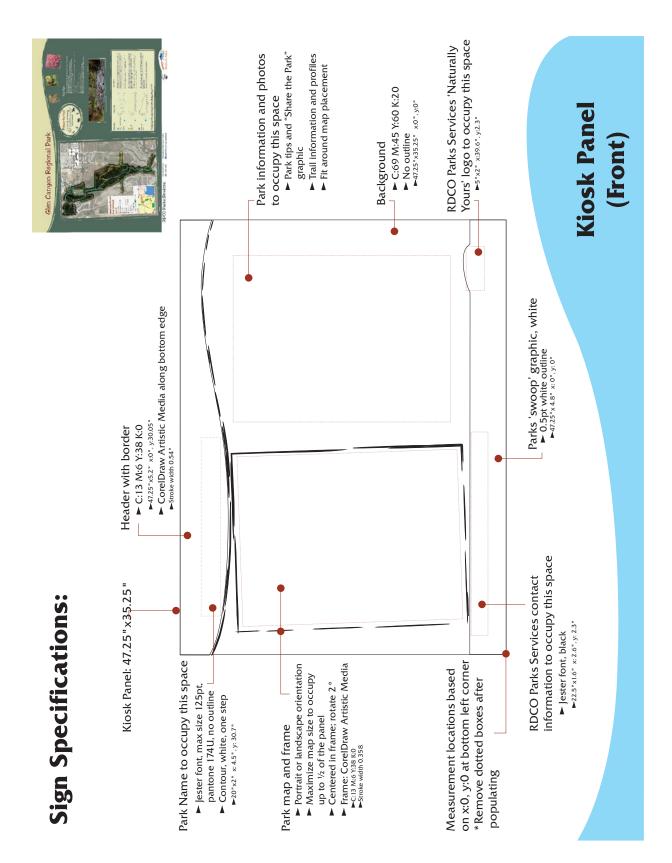
populating

based on x:0, y:0 at bottom Measurement locations

left corner



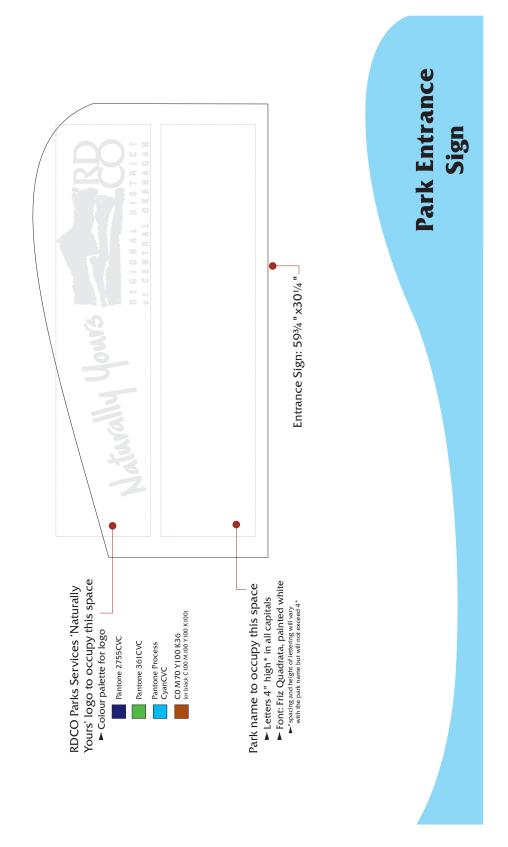
### Yours' logo to occupy this space RDCO Parks Services 'Naturally You Are Here Sign ► C:69 M:45 Y:60 K:20 ► No outline ► 23.75" x:0", y:0" (Landscape) ► 2.3" x1 " x:17.8", y:1.4" Background ► 23.75" x2.9" x0", y:14.8" ► CorelDraw Artistic Media along bottom edge ► Stroke width 0.295 Header with border ► C:13 M:6 Y:38 K:0 — Parks 'swoop' graphic, white ► 0.5pt white outline ► 2375" ×2.5" ×:0", y:0" You Are Here Location Map: information to occupy this space RDCO Parks Services contact 23.75"×17.75" ► Jester font, black ► 9.75" x0.65" x:1.45", y:1.35" Sign Specifications: Measurement locations based on x:0, y:0 at bottom left corner ► Frame: CorelDraw artistic media ► Frame: CorelDraw artistic media ► C:13 Mic Y:38 K0 ► Stroke width 0.358" ► 20.5" x11.5" x1.55", y2.9" Park name to occupy this space Jester font, pantone 174U, max size 56pt, no outline Contour, white, one step II xi.2" xi.5", yi.5.3" *Remove dotted boxes after Park map and frame Map centered in frame 19.5" x10.5" x2.0", y3.3.3" populating



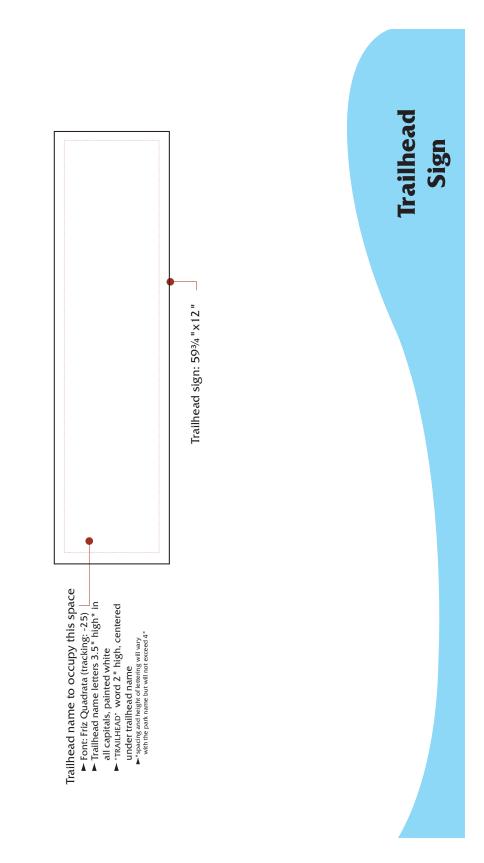
#### ► Regional parks map ► Centered in frame; rotated 356.8° Yours' logo to occupy this space ► Frame: CorelDraw Artistic Media ►C.13 M:6 Y:38 K:0 ►Stroke width 0.041 " RDCO Parks Services 'Naturally Parks 'swoop' graphic, white ✓ 0.5pt white outline ✓ 47.25* × 4.8* × 0*, y: 0* ► C:69 M:45 Y:60 K:20 ► No outline ►47.25" x35.25" x:0", y:0" **Kiosk Panel** Park map and frame ►5"x2" x:39.6", y:2.1" (Back) Background Nature quote to occupy this space • Bradley Hand ITC font, black, pt 23 • Corner frame: CorelDraw artistic media • Cass RG, since width 033 • Centered between logo and contact information ► CorelDraw Artistic Media along bottom edge ► Stroke width 0.54" ►47.25"x5.2" x:0", y:30.05" ► C:13 M:6 Y:38 K:0 Header with border information to occupy this space RDCO Parks Services contact ▼13.5"×1.8" x: 2.5", y: 2.1" ▶ Jester font, black Sign Specifications: Kiosk Panel: 47.25 "x35.25 " ► Heading text: Jester, white, 90 pt ► Body text: Helvetica, white, 36 pt Park Name to occupy this space ► Heading text: Jester, white, 45 pt Park rules to occupy this space ► Jester font, max size 125pt, Park information and photo ► Subtext: Jester, white, 28 pt pantone 174U, no outline Measurement locations ► Contour, white, one step ►20"x2" x:4.5; y:30.7" *Remove dotted boxes based on x:0, y:0 at to occupy this space bottom left corner after populating ▶ Park description

## GLEN CANYON REGIONAL PARK

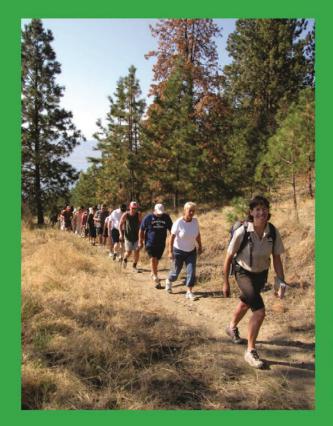
# Sign Specifications:



# Sign Specifications:



	Regional Parks Design Guidelines
APPENDIX E: REGIONAL PARKSTRAIL RATING	Calliberines
ATTENDIA E. REGIONAL TARRES TRATE RATIIN	JUMPLLINES

## Regional Parks Trail Rating Guidelines



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#### RDCO Parks Services Trail Difficulty Ratings

Trail difficulty ratings give visitors an idea of what to expect when hiking on trails in Regional Parks. Parks Services has adopted a 5-level trail rating system including categories for very easy, easy, moderate, difficult and very difficult. It is important to note that trail difficulty ratings differ from trail construction standards, for which regional parks also has a 5 level system. Trail difficulty ratings are provided to allow a visitor to confidently make a decision as to whether a trail is within his/her abilities and in doing so, provide a baseline to compare other trails within the Regional Parks system for future hiking opportunities.

Currently there is no standardized method available, provincially or regionally, to rate the trail hiking experience and communicate this to visitors. The closest systems are for mountain biking or downhill skiing and both use a version of the green, blue, black trail rating to indicate easy, moderate and difficult, respectively. With the green, blue, black colouring already established in these other sports, it was logical for Parks Services to use them and apply the colours to the hiking experience.

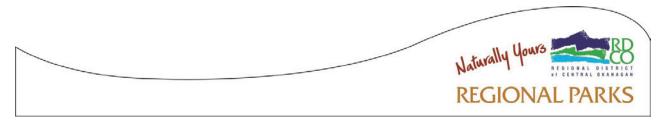
Trail difficulty ratings are determined based on ideal conditions; usually during summer under normal conditions. Seasonal changes will usually make a trail more difficult (i.e. winter trails may be hard to follow or covered in ice while spring hikes may be muddy). Additionally, ratings reflect the overall conditions, so if there is a moderate section of trail in an otherwise easy trail, the trail gets an easy rating. The inclusion of a written trail description will point out any situations that differ from the overall rating.

The ratings are also based on an average adult fitness level. If you are unsure where your fitness level fits in to the rating, it is advised to start with an easy hike and that will allow you to judge what you are capable of for future hiking. One must be aware that an easy hike for one person may, in fact, be a moderate hike for another.

The main factors influencing the difficulty rating in the 5-level system are:

- Average gradient
- Overall elevation change
- The trail condition (to a lesser extent: it will factor into ratings that fall close to one another)

Since hiking is an inexpensive physical activity that most everyone can participate in, it is the intent that the 5-level difficulty rating system will meet the needs of visitors to appropriately determine if a particular trail is suitable by allowing them to make informed decisions based on clear, concise information (thus minimizing someone from choosing a trail that is beyond his/her physical abilities) as well as to establish a consistency between ratings of trails in all other regional parks so that an experience in one park will offer the same or similar experience in another park.



		Trail Rating Syste	Trail Rating System for Visitors to Regional Parks	egional Parks	
	Very Easy	Easy	Moderate	Difficult	Very Difficult
	0	•		<b>*</b>	*
Description	Description Characterized by flat, smooth, well-defined trails. Suitable for all ages and abilities, including people with reduced mobility and those in wheelchairs. No obstacles.	Characterized by mostly flat, smooth, well-defined trails with gentle, infrequent slopes. Suitable for most types of people but are not universally accessible. Few to no obstacles; stairs may be present.	Characterized by generally flat trails with sections of continuous slight grades and some short, steep sections. The footing may be uneven and obstacles appear more frequently. Suitable for people with an average level of fitness.	Characterized by hilly trails with sections of continuous moderate grades and steep sections. Footing is uneven and obstacles are frequent. Suitable for people with a moderate level of fitness.	Characterized by trails that are typically not well-defined, with frequent steep sections or sustained steep climbs. Footing is uneven with frequent obstacles that may require stepping up or over to pass by. Suitable for people with a high level of fitness.
Gradient(%)	%5-0	6-10%	11-20%	21-25%	76+%
Elevation Change(m)	0-10m	11-50m	51-150m	151-300m	300+m
Other Considerations (These factors may influence the trail rating and will most probably come into play when deciding on a trail ranks closely between two ratings.)	Trail wic Surfacin Slopes:	£ 89	Trail width: Is the trail very wide (4+m) or very narrow (<0.5m)?  Surfacing: Is the trail surface firm/hard or loose and soft?  Is the trail smooth with no obstacles or uneven with many obstacles?  Slopes: Is the trail flat, are there inclines/declines and if so, how steep or frequent Does the trail have cross-slopes and if so, how steep or frequent are they?	Is the trail very wide (4+m) or very narrow (<0.5m)? Is the trail surface firm/hard or loose and soft? Is the trail smooth with no obstacles or uneven with many obstacles? Is the trail flat, are there inclines/declines and if so, how steep or frequent are they? Does the trail have cross-slopes and if so, how steep or frequent are they?	e they?

Notes: 1. For a rating of Very Easy, 100% of the trail must meet the category criteria to achieve the category rating.

- 2. For the ratings Easy, Moderate, Difficult and Very Difficult, 70% of the trail must meet the category criteria to achieve the category rating. 30% of the trail may rate in a category either above or below without influencing the overall rating.
  - Trail ratings are based on typical summer conditions and may increase to a more difficult rating with seasonal changes (i.e. icy in winter, muddy in spring, extremely hot in summer heat waves). m.
    - Obstacles include: embedded or loose rocks, ruts, branches, logs, wash-outs/erosion areas, stairs, boardwalks, wig-wags, etc. 4

### 5 Level Rating System


	Regional Parks Design Guidelines

### APPENDIX F: PROJECT PLANNING CHECKLIST

The following document has been created to assist in the planning and development of projects within regional parks. This checklist includes approvals, permitting, notifications, consultations, and other data that may be required for these projects.

Final


#### Project Name

	<b>✓</b> Details
Park Location	V Betails
Street Address	
Legal Description	
Zoning	
Park Classification By Mgmt Class Conservation	
Natural	
Recreation/ Cultural/ Waterfront	
Trails (Greenways)	
Tenure and Type (titled, SRW, etc.)	
RDCO	
PID#	
Crown	
LOC & File No.	
City	
Other	
Agreements	
(List any agreements - grants, maintenance contract, stewardship, memorandum of	
understanding, water licence, covenants,	
etc.)	
Approvals, Permits & Other Requirements	
Provincial	
FrontCounter BC Notification or	
Application	
Section 9 Water Act	
Dept. Fisheries & Oceans - Notification or	
Application for HADD authorization	
Transport Canada - Navigable Waters	
ILMB - Tenure Branch	
Riparian Area Regulation	
Ministry of FLNRO - Cutting Permit	
Burn Permit (Crown)	
Minstry of Transportation - Permit to	
Construct in Road ROW	
Electrical Permit	
Interior Health	
Archaeological Impact Assessment &	
Permit	
Environmental Assessment	

RDCO	
G & S Committee	
Regional Board Approval	
Environmental DP	
Building Permit	
Hazard Tree Assessment	
Municipal	
Referral Required Environmental DP or waiver	
Hillside DP	
Aquatic DP Wildfire DP	
Terrestrial DP	
Building Permit	
Construction in Road ROW Approval	
Burn Permit (Local Fire Dept.)	
4 . 1 . 17 . 10	
Agricultural Land Commission (ALC)	
Application & Approval	
Soil Permit	
Partner (NGO)	
Consultation Required	
Approval Required	
Approval Required	
Utilities	
Fortis BC (Gas)	
BC Hydro	
Fortis BC (Electrical)	
Telus	
Water Purveyor BC One Call (Locates)	
BC One Call (Locates)	
Consultation	
Project Partners	
Public	
First Nations	
Crown	
Forest Licensees	
RDCO Parks Services - Staff	
RDCO - Communications Officer	
Media Release - PSA	

Critical Time Constraints	
Provincial Approvals	
Fisheries Work Window	
Nesting & Breeding Season (Species at Risk)	
Kokanee Spawning	
Public Access - Notification of Works & Closure	
Grand Opening Event	
Parks Interpretation Programs & Event Bookings	
Other	
Parks Services Planning Documents (Higher Level)	
Parks Services Strategic Plan	
Regional Parks 2011 Branding - Visual Standards Manual	
Official Regional Parks Plan (ORPP) Bylaw 884	
Central Okanagan Regional Parks Legacy Program	
Regional Parks & Greenways Plan (2008-2020)	
Regional Parks Operational Wildfire Protection Plan	
Crown Land Acquisition & Management Plans (Black Knight Mtn, Hydraulic/ McCulloch Lake, Trepanier Creek, Spion Kop)	
Kelowna & Area Mtn. Bike Strategy	
Major Lakes Recreation Marine Facilities Study	
Urban Forest Health Strategy	
Park Preplans (Ellison Area, Mt. Boucherie, Shannon Lake Trails, Westside Rd, etc.)	
Regional Parks Design Guidelines	

Specific Park Documents	
Park Acquisition File Park Master/ Management Plan Interim Management Statement	
Park Master/ Management Plan	
Interim Management Statement	
Biophysical Inventory Report	
Park Concept Plan	
Site Development Plan	
Heritage Conservation Report	
Archaeological Assessment	
Environmental Assessment Report	
Parkland Provision and Development - Servicing Agreement (PPDSA)	
Tree Planting	
Silviculture Survey	
Danger Tree/Wildlife Tree Assessment	
Fuel Management Prescription	
Playground Inspections	
Parks GIS Database Information	
Trail Mapping	
Wildlife Tree Locations	
Hazard Tree Locations	
Species at Risk Mapping	
RDCO Planning Documents	
Zoning Bylaw	
Official Community Plan Bylaws	
Subdivision Servicing Bylaw	
Other Considerations & Comments	
Upcoming Capital Development Plans & Timelines	
Project Funding	
Budget Assigned	
RDCO Funding	
City Funding	
Grant Funding	
NGO Funding	
G.L. Codes	
Revenue Code	
Expense Code	
Budget Spent	
RDCO - Amount & Year	
	,
Project File Location	
Filepath	

		Regional Parks Design Guideline	s
APPENDIX (	G: PAINT PRODU	ICT & COLOUR STANDARDS	
DECEMBER 2015	Final	APPENDIX G: PAINT PRODUCT & COLOUR STANDARD	S


#### Paint & Stain Colour List

Cloverdale Products & Modern Paint and Floor

Picnic tables	
	Two coats semi-gloss latex Kannanaskis (N784/078)
	New boards tinted with primer first coat
	Block biffies - painted
Metal doors	
	First coat - primer
	Second coat - semi-gloss latex Kannanaskis (N784/078)
	Third coat - (as required) semi-gloss latex Kannanaskis (N784/078)
Wood trim	
	Kananaskis solid latex stain/semi-gloss paint
Exterior bloc	k
	First coat - latex block filler
	Second coat - latex primer
	Third coat - semi-gloss latex 807(1) Silver Sage
Interior bloc	
	First coat - latex block filler
	Second coat - latex primer
	Third coat - semi-gloss latex 807(1) Silver Sage
Concrete floo	
	One coat porch/floor grey
Interior bloc	
	One coat clear sealer around toilet (up to 3' from floor)
Wood bollard	ls and fencing
	Two coats Cetol 1-078
New entrance	e signs & posts
	Two coats Cetol 1-072 Butternut
Old sign pos	ts
<b>.</b>	Repaint to Oxford Brown
Gazebos	
Post	s: Two coats Cetol 1-078
Fascia	a: First coat - latex primer or stain Kananaskis
	Second coat - semi-gloss latex or stain Kananaskis
	Third coat - (as required) semi-gloss latex or stain Kananaskis
Heritage buil	
	Use original colours (see specifications)
Kiosks	
Post	s: Two coats Cetol 1-078

Litter barrels	
	One coat national blue (marine enamel)
Log homes &	C shops
	Exterior:Two coats Cetol 1-078
	Exterior door/window trim: 43607 Natural Wood Finish
	Interior door/window trim:CWF by Flood Co. or natural stain
Metal gates	
	One coat black corro-stop (Industrial Plastics) or Tremclad
Vented metal	soffits
	Pre-painted white or repaint with semi-gloss oil or latex Silver Sage (807-1)

Trailheads

2-3 coats Cetol 1-078

#### New parks signs & posts

Cetol 1-072 (Butternut) with two coats log and siding clear finish (Cetol brand)

	Regional Parks Design Guidelines
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APPENDIX H: MAINTENANCE STANDARD	08


Trail Classifications and Construction Standards for Central Okanagan Regional Parks

			TRAIL CLASSIFICATIONS		
	Type 1	Type 2	Type 3	Type 4	Type 5
	Fully Improved	Highly Improved	Improved	Minimally Improved	Rustic
Trail Attributes					
Tread Width	2.0-3.0m	1.0-3.0m	0.5-1.0m	0.5-1.0m	max. 0.5m
Cleared Trail Width	5.0-6.0m	2.0-5.0m	1.1-1.3m	1.3m	N/A
Cleared Trail Height	3.0m	2.4m	2.4m	2.4m	2.4m
Max. Gradient	%8	10%	10-12%	N/A	A/N
Avg. Gradient	2%	2-8%	10%	N/A	N/A
Traffic Flow	Double Track	Single/Double Track	Single Track	Single Track	Wilderness Single Track
Tread Type	Machine Built - Compacted Imported Crusher Chip, Asphalt, Concrete, Paving Stone	Machine Built - Compacted Imported Crusher Chip or Gravel	Hand Built - Compacted Imported Crusher Chip or Gravel or Native Soil Material	Natural Native Trail Surface with Partial Hand Built Sections using Native Soil Material	Tread Improvements Related Only to Protection of Natural Ecosystems, Otherwise No Trail Improvements
Tread Material	Imported	Imported	Imported - Native	Native	Native
Obstacles	Smooth Trail	Few to None	Infrequent	Infrequent to Frequent	Frequent
Obstacle Type	N/A	Embedded Rocks <2.5cm	Embedded Rocks, and Roots <5cm	Embedded and Overlaid Rocks, logs and Roots <20cm	Embedded and Overlaid Rocks, Logs, and Roots
Structure Types	Engineered Bridges, Boardwalks, Engineered Tunnels, Culverts, Kiosks, Washrooms, Retaining Walls	Engineered Bridges, Boardwalks, Stairs, Engineered Tunnels, Culverts, Kiosks, Washrooms, Retaining Walls	Engineered Bridges, Boardwalks, Stairs, Culverts, Kiosks, Retaining Walls	Suspension or Log/Pile Supported Bridges, Stairs, Boardwalks, Retaining Walls	Minimal to No Structures - Log/Pile Supported or Suspension Bridges (large spans).
Signage	Enhanced Signage with Large Kiosks for Maps, Information, and Interpretive Education, and Trail Markings	Enhanced Signage with Large Kiosks for Maps, Information, and Interpretive Education, and Trail Markings	Small Information Kiosks and Small Wayfinding Maps, Trail Markings, and Interpretive Education	Small Wayfinding Maps and Trail Markings	Trail Markings
Environment	Frontcountry Nature / Urban Interface, Larger Creek Corridors or Lake Waterfront	Frontcountry Nature / Urban Interface, Larger Creek Corridors or Lake Waterfront	Frontcountry / Backcountry Natural Areas Peripheral to Urban Areas	Backcountry / Wilderness Trails	Wilderness
Level of Service	High	Moderate-High	Low-Moderate	Low	Nil
Typical Physical Difficulty Rating	Easy	Easy - Intermediate	Easy - Intermediate	Easy - Very Difficult	Easy - Very Difficult
Typical Technical Difficulty Rating	Easy	Easy	Easy - Intermediate	Intermediate - Very Difficult	Intermediate - Very Difficult
Typical Overall Rating				<b>*</b>	<b>*</b>

			TRAIL LEVELS OF SERVICE		
	Type 1	Type 2	Type 3	Type 4	Type 5
	Fully Improved	Highly Improved	Improved	Minimally Improved	Rustic
		Wir	Winter		
Seasonal Level of Service	Moderate	Ϊ̈́Z	Nil	IIΝ	Nil
	Snow Plowing - Within 24 hours of a Snowfall with an Accumulation Greater than 5cm	N/A	N/A	N/A	N/A
Action Item Frequency	Sanding - At Ingress/Egress Points such as Road Intersections as required	N/A	N/A	N/A	N/A
	Drainage - As required to ensure removal of standing water	N/A	N/A	N/A	N/A
21.4c+3 /2cd	C	Open or Closed	Open or Closed	Open or Closed	Open of Closed
rain Status	Open	Dependent on Use	Dependent on Use	Dependent on Use	Dependent on Use
		Spring - Sur	Spring - Summer - Fall		
Seasonal Level of Service	High	High-Moderate	Moderate-Low	Гом	Nii
	Snow Plowing - Within 24 hours of a Snowfall with an Accumulation Greater than 5cm	N/A	N/A	N/A	N/A
Action Item Frequency	Sanding - At Ingress/Egress Points such as Road Intersections as required	N/A	N/A	N/A	N/A
	Drainage - As required to ensure removal of standing water	N/A	N/A	N/A	N/A
Park Status	Open	Open	Open	Open	Open